STATUS OF THE COLLECTIONS OF THE AMERICAN MUSEUM OF NATURAL HISTORY IN THE YEAR 1923

Extract from the Fifty-fifth Annual Report of the President, entitled "The American Museum and the World"

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THE AMERICAN MUSEUM AND THE WORLD[1]

By President Henry Fairfield Osborn

KING HENRY. O heaven! that one might read the book of fate;
And see the revolution of the times
Make mountains level, and the continent
Weary of solid firmness, melt itself
Into the sea! and, other times, to see
The beachy girdle of the ocean
Too wide for Neptune's hips; how chances mock,
And changes fill the cup of alteration
With divers liquors!

—*Shakespeare, Henry IV*

TO bring the world of nature within the walls of a great city to those who cannot otherwise see the world, who cannot explore or travel, who cannot go very far beyond their immediate environment—this seems to be the primary object of a great municipal museum. We cannot be local. We cannot be provincial. We cannot confine ourselves to the boundaries even of a great country like our own. We must extend to other lands and seas and to all parts of the globe. We must give a vision, not only of the earth but of the depths of the seas below and of the firmament above. In a city like New York, with people from all parts of the globe, we must give the people the inspiration, the broad vision, the largeness of mind, and the breadth of sympathy which come to their more fortunate brethren who are able to travel and explore. By our methods we show not only the animals and plants, but where and how they live.

This compass of the world of nature is not a matter of recent decision, but extends back to the very foundation period of the Museum and to the original plan of the building. In fact, the American Museum began in 1869, in Albert S. Bickmore's time, with collections from the Old World—from the East Indies, from southern Asia, from Africa—because in the period of our foundation the whole science of natural history had been built up by the great French and British savants on collections from the Eastern Hemisphere. It was only through the labors of great American naturalists and explorers like John J. Audubon, Spencer F. Baird and F. V. Hayden that the riches of North America began to be

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fully appreciated and the American Museum waked up to the fact that it must thoroughly explore North America itself, in co-operation with the United States National Museum and other great museums of this country.

Then it was realized that South America had been sadly neglected and overlooked, and our late Curator Allen repeatedly urged the exploring of this continent, which finally resulted in a series of highly successful expeditions, which are still going on. Then in the beginning of the year 1908 a great new movement started for fresh exploration, along entirely new and much more thorough lines, in the Eastern Hemisphere, beginning in Africa and continuing with our present surveys and discoveries in Asia. Nor was Europe forgotten: Italy, Spain, France, Great Britain, Scandinavia and Germany were visited, for both original and exchange material, illustrative especially of its palæontologic history and the pre-history of man. In the meanwhile, expeditions were sent both to the North Polar and to the South Polar regions, and contact was made with great Arctic and Antarctic explorers. Thus, during the past fifty-five years, the American Museum has gradually become a *World Museum* in its collections, and it is expressing this great fact in its building units.

Our chief concern during the last two decades has been to secure the fast vanishing world of Nature, especially in Asia, Africa and Polynesia, for it is evident that man and civilization will before long obliterate animate nature in the greater part of the globe and will destroy or blemish inanimate nature where it is not protected by the national and international spirit of conservation. In order to demonstrate the present resources of the American Museum in its world collections and to show clearly the parts of the globe from which we have little or nothing, a series of maps is presented herewith by the Chief Curators in the Scientific Departments of the Museum. These have been carefully edited and arranged by Assistant Director Murphy. The scientific departments as more or less organized in 1924 are as follows:

Prehistory of the Earth

Astronomy—the earth, the sun, the heavens—Astronomic Halls.

Mineralogy—minerals and gems—The Morgan Hall.

Geology—geography, physiography—Halls of Geology.

Life History of the Earth

Invertebrate Palæontology—lower fossil life—Gallery and Halls.

Vertebrate Palæontology—higher fossil life—Five Halls in sequence.

Existing Life of the Earth

Lower invertebrates of sea and land—Darwin Hall and Gallery.

Entomology—insect life of the earth—Insect Life Hall.

Ichthyology—fossil and living fishes—The Hall of Fishes.

Herpetology—living amphibians and reptiles—Hall of Reptiles.

Ornithology—living birds of the world—Four Halls of Birds.

Mammalogy—living mammals of the world—Six Halls of Mammals.

Man—Prehistory and Living Races

Archæology—prehistory of man—Archæologic Hall.

Anthropology—living races of man—Thirteen Halls of Anthropology.

Comparative and Human Anatomy—Hall of Osteology.

Nature and Man—public health—Education Hall.

A survey of the collections and exhibitions in the various departments of the Museum shows a vast increase over that recorded by the inventory of 1911.* The greater part of the new material has been derived from the constantly extending scientific expeditions of the Museum, most of which have been made possible through the generosity of its friends. The collections have been extended further through the outright gift or bequest of material and through exchanges with kindred institutions in many parts of the world.

NORTH AMERICA

Among the chief collectors for the Museum in North America are Messrs. Anderson, Andrews, Anthony, Batty, Boas, Brown, Chapman, Comer, Elliot, Farrand, Figgins, Gidley, Goddard, Granger, Gregory, Hovey, Lowie, Lutz, Matthew, Mearns, Morris, Nelson, Noble, Osborn, Peary, Putnam, Richardson, Saville, Smith, Spinden, Stefansson, Stone, Thomson, Townsend, Watson, Wheeler, Whitfield, Wissler, Wortman.

North America is naturally more richly represented in practically all departments than any of the other great divisions of the earth. Only the region of Central Ungava and a large area west

*Osborn, H. F., 1911. *The American Museum of Natural History—Its Origin, Its History, The Growth of Its Departments to December 31, 1909.*

of Hudson's Bay may be said to be poorly represented by specimens in the departments pertaining to the Divisions of Geology, Zoology and Anthropology.

Geology and Invertebrate Palæontology is represented by collections numbering almost three-quarters of a million specimens from the world as a whole, including fossils, rocks, meteorites, etc., from practically all of the United States, the central and western British provinces and from Alaska. Within our own territory, New York, Indiana and Oklahoma are most strongly represented, with various other States such as Georgia, California and Minnesota following hard. The Curators have compiled a map in great detail, showing the proportionate distribution of collections in all States and other political units of North America and other continents, from a few of which as many as 400,000 specimens are noted.

Minerals are computed somewhat differently, and the Curator has indicated the percentage of the Museum's total collection made up of specimens from various major divisions of the globe. While this system gives no indication of the completeness of our series with reference to all known forms of minerals, it does indicate clearly the parts of the world adequately represented in the Museum, those (such as Australia, Eastern Asia and South America) which are poorly represented, and still others (such as Africa, Madagascar and Arabia) from which we have practically no material. As regards North America, 36 per cent. of the Museum's mineral collections are from the area of the United States, and 6 per cent. from Canada, Alaska, and the Arctic lands to the northward.

In *Vertebrate Palæontology,* 20,000 fossil mammals and 6,000 fossil reptiles of the collections are North American. Of these by far the greatest portion was secured from the Great Plains and Rocky Mountain regions. Considerable material, especially of the Proboscidea, represents Alaska, Indiana, Texas and New York. California has yielded material from the La Brea tar pits as well as Mesozoic reptiles. Oregon, Arizona, Arkansas, Florida, South Carolina, New Jersey and other states have contributed smaller amounts.

The *Marine Life* and *Invertebrates of the World,* other than Insects, are richly represented by specimens from North and Cen-

tral America and the West Indies, except throughout a zone extending through eastern Labrador and southern Alaska. Every State of the Union has contributed its quota, the total number of identified and catalogued North American specimens being well over 100,000. California is represented by over 11,000 specimens, Massachusetts by 3,000. The great bulk of the Canadian collections was obtained in Nova Scotia, though practically all parts of southern Canada are represented. The several Arctic expeditions in which the Museum has had a part have enriched its invertebrate collections by specimens from North Greenland and other areas within the Arctic Circle.

The *Insect* collections from North America are so large that it would be out of the question to number either species, specimens, or localities. The plotted information, however, shows that the area of the United States, Central America, and the West Indies is well represented, the Middle Atlantic States, Florida and parts of the Rocky Mountain region being richest, although collecting localities include Newfoundland, Labrador, both Southwestern and Arctic Alaska, and Western Greenland. The northern parts of North America may be said, in general, to be rather weakly represented by specimens, but the insect fauna there is not rich.

Since only fresh-water *Fishes* lend themselves to a continental survey scheme, the Curators have prepared separate tables for oceanic and river forms. The fresh-water fishes of the continent, however, make up 9 per cent of our total collection and include 80 per cent. of the genera recorded from the area. This is an indication of the richness of the Museum's ichthyological collections, which comprise some 30,000 specimens. One quarter of our collection comes from the Atlantic and another from the Pacific, and these include, for the respective regions, 70 per cent. of the total number of known living genera.

In *Reptiles and Amphibians,* North America is again the best represented of the continents, partly because it is the region which has been most worked by Staff members of the Museum, but also because it is rather richer in genera and species of urodeles than any of the other great divisions of the earth. From the greater part of the Atlantic seaboard of the United States, from the northern Gulf Coast, the Great Basin, Lower California, the Olympic

Mountain region, and several areas of Central America, nearly all known species of reptiles and batrachians have been obtained by the Museum. Throughout the remainder of the parts of the continent inhabited by animals of these groups, from 35 to 75 per cent. of the fauna is represented in the collections, which have grown nearly 1,000 per cent. during the course of fourteen years. Prior to 1900 we had no study collections of reptiles and amphibians; in 1909 there were about 6,000 specimens; today we have more than 57,000 adult specimens, and our collections may be ranked among the five largest in the country.

The Museum possesses an essentially complete collection of North American *Birds*. The representation is naturally larger than that from any other continent, partly because of the many historic collections which have been bequeathed to the Museum, and also because the wonderfully extensive private collections of Dr. Jonathan Dwight and Dr. Leonard C. Sanford are included in the present inventory. Not a single species of living or recently extinct bird from the part of the continent north of Mexico is lacking, with the possible exception of Pallas's cormorant, which is a doubtful member of the North American avifauna. Among the Museum's treasures are three great auks (including Dr. Sanford's example and the specimen deposited with us by Vassar College), also adequate series of the Labrador duck, the passenger pigeon, the Carolina parakeet, the Eskimo curlew, the heath hen, and other striking forms which have been completely or nearly extirpated by man.

From the regions of Mexico and Central America, we have examples of all the known genera. With the exception of the Dwight Costa Rican collection and the Museum's Nicaraguan series, we have, however, no really adequate Central American material, being especially weak in the avifauna of Guatemala, Honduras, extreme southern Mexico and eastern Panama.

From the West Indies, the Museum possesses very nearly all the known species, although many of these are represented by only a specimen or two.

The distribution of the collections of *Mammals of the World* follows that of most of the other zoological groups, except that the Arctic lands are extremely well represented, the principal voids being in the area from Ungava to western Alaska and in part of

the Mississippi valley. North America is represented by some 22,330 skins and skulls, of which California, with slightly more than 2,000 specimens, has the largest proportion of any single State, while Iowa, Indiana, South Carolina, Kentucky and Illinois are most poorly represented. British Columbia comes first and Newfoundland last in the Canadian area.

The division of the *Sciences of Man* has comprehensive *Archæological* and *Anatomical* collections from well distributed areas in eastern, southern and western North America, as well as general collections from the greater part of the continent, except the usually little explored regions of north central Canada, Ungava, and the far Northwest. In the case of *Ethnographic* material, the facts are rather the reverse, our principal treasures coming from the West and Northwest, the northern part of the Mississippi Valley, and the Arctic Coast including Greenland; while southeastern North America, including the West Indies, is very poorly represented except for small portions of Florida and the southern Appalachians.

SOUTH AMERICA

Among the chief collectors in South America are Messrs. Anthony, Bandelier, Beck, Beebe, Brown, Carriker, Chapman, Cherrie, Collins, Day, Miller, Murphy, Roosevelt, Spinden, Watkins.

Throughout most of this continent, *Geology and Invertebrate Palæontology* is represented by from 25 to 1,000 specimens from each of the great political divisions. Argentina is the source of almost 1,000 specimens, while Ecuador, Paraguay and Uruguay are without representation.

In spite of the richness of South America in *Mineral* resources, only one per cent. of the Museum's total collection comes from Brazil, one per cent. from Chile, and less than one-half of one per cent. from the remaining territory.

In *Vertebrate Palæontology,* the South American section comprises about 4 per cent. of the total collection of fossil mammals and a smaller percentage of fossil reptiles. The nucleus of this is the Cope Pampean Collection, from Patagonia, with other collections from the same country made by Mr. Barnum Brown. A small amount of miscellaneous material represents Ecuador and other parts of South America. A considerable amount of late Tertiary and Pleistocene material has been secured from Cuba, Porto Rico and Jamaica.

In the Department of *Lower Invertebrates* we have an excellent series of fluviatile species, as well as terrestrial forms, such as myriapods, land mollusks, isopods and worms, from northern South America, both coastal and interior. The remainder of the collections comes chiefly from the fringes of the continent but includes every country, as well as outlying islands such as the Galapagos, Juan Fernandez, the Fuegian Islands, South Shetlands, Falklands, and South Georgia. The total number of South American specimens is 11,430. The greatest single collections from the continent bear labels referring to British Guiana and Patagonia.

The distribution of South American *Insect* collections is in the main similar to that of other invertebrates, except that the interior of the great Amazon Basin is surprisingly well represented by localities; and Doctors Crampton and Lutz conducted a successful expedition in British Guiana. In most instances this means but a few specimens, or perhaps only a single specimen, but in the case of no other branch of science, except Ornithology, is the continent of South America so generally covered.

Nine per cent. of our total collection of *Fishes* comes from South America, representing 60 per cent. of the genera known from that continent.

In *Amphibians and Reptiles* we have collections from the greater part of the continent, though large areas in the interior are as yet unrepresented. From several important stations in the Andes and from British Guiana, 75 to 100 per cent. of the reptile and amphibian fauna has been obtained.

Our South American collection of *Birds* is constantly becoming more rounded out. We have excellent general material from the greater part of the continent, with the exception of eastern and southeastern Brazil and one or two other smaller areas. In general, we are strong throughout the Andean system, our intensive collections from Colombia and Ecuador being incomparably the finest in the world. Important among the recent South American accessions are the birds collected during Dr. Chapman's numerous expeditions, the Roosevelt-Cherrie collections from Matto Grosso, and others from Santa Marta, Peru, Chile, southern Patagonia and Tierra del Fuego.

Curator Anthony's work has led to a great increase in our collections of South American *Mammals*. Ecuador, represented by

more than 5,000 specimens, leads the list, with Colombia second and Venezuela third. All the other republics have sent at least a small quota, but Chile, Patagonia, Paraguay, and most of north central South America are as yet very weakly covered by our material. The total number of mammals from South America is 11,650.

In the Division of *Anthropology,* the only comprehensive *Archæological* collections are from Peru, the mouth of the Amazon, and the Caribbean coast of Colombia. General collections in this field represent the greater part of the west coast of the southernmost tip of the continent. *Anatomical* material covers much the same field, Bolivia having yielded the greater part. In modern *Ethnographic* collections, the Cape Horn region, northern Chile, central Brazil and Colombia are represented by small general collections, the only series approaching completeness being from Venezuela and the borderlands of northwestern Brazil.

EURASIA

The chief collectors and explorers of Eurasia have been Messrs. Andrews, Berkey, Bickmore, Bogoras, Brown, Burden, Buxton, Faunthorpe, Granger, Jochelson, Laufer, Morris, Nelson, Osborn, Pope, Vernay. The great recent expansion of our Asiatic collections is due to the First, Second and Third Asiatic Expeditions, under Andrews; to the Indian Expedition under Faunthorpe and Vernay; to the expedition to the Siwalik Hills of India and Burma, under Brown.

In *Geology and Invertebrate Palæontology* the Museum collections cover Eurasia at least thinly from Sumatra to Spitzbergen and from eastern Siberia to Spain. Portugal, Baluchistan, Tibet, Korea, the Malay Peninsula, and the greater part of the East Indies are unrepresented. The blank spaces of Mongolia are, however, being filled in by still unaccessioned material from the Third Asiatic Expedition. Japan, Siberia, Arabia, etc., have yielded both rock specimens and aërolites. Central Europe, particularly Germany and Austria, has yielded our richest collections, the number of invertebrate fossils from these areas alone exceeding 23,000.

The distribution of our *Minerals* is somewhat similar, with a weaker showing, however, from eastern Asia and Malaysia. Southern Europe, from which 14 per cent. of our entire collection of minerals has been derived, comes second to the United States. Western Europe, comprising France, Spain and the British Isles, has yielded 10 per cent.; Central Europe, from Denmark to the Balkans, 8 per cent. Scandinavia and Iceland have furnished 5 per cent.

In *Vertebrate Palæontology,* the collections from Eurasia comprise about 7 per cent. of the total collections of fossil vertebrates. Their most important constituents are the material from Mongolia and Sze-Chuan, China, secured by the Third Asiatic Expedition, and from the Siwalik Hills of India by Mr. Barnum Brown. Other important items are the ichthyosaur skeletons from the Jurassic of Bavaria and a series of casts of fossil man from various localities in Europe.

In *Lower Invertebrates,* the greater part of our Old World collections comes from Europe, particularly from western Europe and the Mediterranean Basin. The European specimens number 14,235, of which 5,000 are Mediterranean and 3,000 British. The Asiatic collection is even larger than the European, but the great bulk of material comes from the seaboard of southern Asia, all of the continent north of the Himalayas and stretching from the Baltic to the Sea of Okhotsk being a blank on the distributional map. Of all parts of the world, this region most needs working from the point of view of this department. Large series of mollusks from Ceylon, the Indian Ocean, China, Turkey, etc., represent in part the work of the Third Asiatic Expedition and that of Mr. Barnum Brown. Other material from China has not yet been officially accessioned.

The collections of *Insects* cover Eurasia, as well as the other continents, more evenly than those of any other department of the Museum. This is doubtless due to the fact that a considerable portion of our Old World collection has been derived from private enthusiasts who added extensively to their collections by purchase and by exchange. Practically no political division, from Iceland to Bering Sea and from the East Indies to Nova Zembla, has failed to yield at least a small quota of insects to the American Museum. In many cases, of course, the representation from any given region is slight.

Five per cent. of our fresh-water *Fishes* comes from Europe and 15 per cent. from Asia. From the latter division of the continent we now have half the number of known genera, Europe being considerably better represented. Four per cent. of our total collection of fishes is made up of Mediterranean marine forms.

In *Amphibians and Reptiles,* only the southerly fringes of the great continent of Eurasia have supplied adequate series. We have

more than one-half of the existing species from Great Britain, western continental Europe, Austria, and parts of Asia, but the only regions adequately worked thus far are eastern China and Formosa.

The Museum possesses no general collection of *Birds* covering the vast territory of Eurasia. We have, however, excellent material from several widely separated parts of the continent. Two of our older collections are largely made up of European birds, the first of these being that of Prince Maximilian of Wied, and the second, the Mearns collection. Dr. Dwight has most of the European water birds, together with considerable additional material from Scandinavia.

In general it may be said that most of the European genera are represented in the Museum, but that we have only a small proportion of the known species, and certain of the latter are represented only by African migrants obtained during the Congo Expedition.

Few parts of Asia are well covered by the ornithological collections, and we have little or nothing from Asia Minor, Persia, Turkestan or western Siberia. The Buxton collection from eastern Siberia gives us at least a fragmentary representation which is rich in coastal species and water fowl. Both Dr. Dwight and the Museum have long owned small but well chosen collections of Chinese birds which are being rapidly enriched through the field work of the Third Asiatic Expedition. Acquisition by exchange of two considerable collections from Japan has helped to fill important gaps from that part of Asia, while India, Assam, Siam, Ceylon and other parts of southern Asia have yielded important material through the field work of Murray, Crozier, Beebe, Bulkley, and more recently that of the Faunthorpe-Vernay Indian Expedition.

Of all the particularly important parts of Asia, the Malay Peninsula and the islands of the East Indies are most poorly represented. We have next to nothing, for example, from New Guinea except a few old mounted specimens. The Wilson collection from the Malay Peninsula, together with birds obtained by Weber in Sumatra, by Raven in Celebes, by Porter and White in the Philippines, and by Andrews in Formosa, Borneo, etc., give us at least a few samples of the wonderfully rich bird life of these regions.

Of *Mammals* we have only 387 specimens from Europe, but close to 9,000 from Asia. A great belt of territory, which makes up the largest single expanse of land on earth and which extends from the Mediterranean northeastward to the Arctic Ocean, is as yet a blank to us. Practically all the Asiatic mammals are new acquisitions and in general they cover the southeastern Pacific face of the continent from India to Bering Strait. The great majority of our specimens has been received from the Asiatic expeditions, but sight should not be lost of the remarkably complete Indian collections obtained by the Faunthorpe-Vernay Expedition and by Mr. Douglas Burden, or of the Malaysian collections made by Mr. Andrews during his earlier work. As regards the Indian ungulates, beasts of prey, etc., it is not unlikely that Mr. Vernay and Colonel Faunthorpe have obtained many species just in time. Fifteen or twenty years hence might well be too late to duplicate this work.

In the Division of *Anthropology,* we have comprehensive (*i.e.* fully adequate) *Archæological* collections of material from the coasts of France, the Low Countries, Germany, Denmark and from the Swiss Lake region. Similar representative collections come from the eastern tip of Siberia and from a small area of eastern Manchuria. General or scattered collections in *Archæology* have had their origin in the British Isles, Scandinavia, Spain, Turkestan, South India, Central Siberia, Indo-China, China and Korea. In *Anatomical* material, our only comprehensive collection is from Hungary. This is supplemented by general collections from Scandinavia, Central Europe, the East Indies, etc. The modern *Ethnographic* material is best represented by the great Siberian collections from the region close to the Arctic Circle, and from parts of southeastern Asia including the Philippines.

AFRICA

Among the collectors who have enriched our African collections may be named Messrs. Akeley, Barnes, Broom, Brown, Chapin, Clark, Granger, Johnson, Lang, Osborn, Rainey, Rainsford, Roosevelt, Tjader.

The *Geological* material from Africa includes an extraordinarily large number of invertebrate fossils from Abyssinia, together with scattering collections of fossils, rocks and meteorites from northeast Africa, the Congo Forest Belt, and temperate

South Africa. Practically all of West Africa, including the Sahara, and of southeast Africa and Madagascar, are unrepresented.

In *Minerals* the continent is sparsely developed and therefore is represented by few specimens.

The African element in the collections of *Vertebrate Palæontology* comprises about 3 per cent. of the total. It consists chiefly of the collection of Eocene and Oligocene mammals from the Fayûm District in Egypt, and the Broom collection of Permian reptiles from South Africa.

We have more than 40,000 examples of *Lower Invertebrates* from Africa, but the greater part is from the Congo Forest region and was obtained during the long sojourn of Messrs. Lang and Chapin. There are 28,700 specimens in this, the largest single collection that has ever been accessioned by the department. Other important sources have been British East Africa, the Union of South Africa, French West Africa, the Island of Mauritius, and the Cape Verde archipelago. The same general facts apply to the Department of *Insects,* but in addition to the great collection of Congo forms, almost the entire shore line of the continent is covered to a certain extent, the principal voids lying in the Sahara and in the arid parts of south central Africa.

The fresh-water *Fishes* of Africa make up 9 per cent. of our total collection and 60 per cent. of the genera known from the continent. Fifty per cent. of the known genera of fishes in the Indian Ocean is also to be found in our study collection and may well be noted here.

The Department of *Herpetology* shows again the importance and far-reaching effect of the great Congo Expedition, because almost 100 per cent. of the known amphibians and reptiles from the Congo Forest is represented in the Museum. Other important collections of reptiles and amphibians come from South Africa, and from East Africa near the mouth of the Red Sea. Our remaining specimens are chiefly coastal and from scattered localities, although Madagascar has given us possibly one-tenth of its known herpetological fauna.

Our only full and adequate collections of African *Birds* are those obtained in the Belgian Congo during the memorable Lang-

Chapin Expedition. More than 75 per cent. of the species occurring in the Congo Forest is represented in the Museum collections, mostly in the form of excellent series. We also have many species from the Cameroon. North Africa has as yet yielded us scarcely any part of its avifauna, with the exception of a few skins from Egypt. We have nothing from the great desert area and only a little from upper Guinea and the region of the White Nile. A collection of East African birds obtained during the Tjader-Lang Expedition has been recently enhanced through the purchase of the Loveridge collection from Tanganyika Territory. Other small collections bear the labels of localities in Natal and Rhodesia, but we have practically no material from Cape Colony, Southwest Africa or Angola.

Madagascar is represented by species which cover the majority of the genera. The greater part of these are the result of recent purchases from Professor Lamberton.

The *Mammalian* collections are principally from Central Africa, the Congo, and the Lake Region, the country about the head-waters of the Nile, etc., having yielded the greater part of our 6,500 specimens. In amassing this material, the work of Lang, Chapin and Akeley comes first, although the contributions by the very large number of the Museum's friends have filled very important gaps. In general it may be said that we are woefully deficient in mammals from all of North and West Africa and from the greater part of South Africa. It should be added that only the larger so-called "game" mammals are adequately represented. The only exception pertains to the Congo Region and Tanganyika territory, in which Lang and others devoted as much attention to rodents, insectivores and other small groups as to the more spectacular forms. We have little material worth mentioning from the important Madagascan field.

In *Anthropology,* we have no comprehensive *Archæological* or *Anatomical* African material. Comprehensive *Ethnographical* collections have been brought to the Museum from the Central Forest Region, Central South Africa and the Gold Coast, while the rest of the continent south of 15° N., and including Madagascar, has yielded fairly good general collections. From north of the Sahara, we have nothing.

AUSTRALIA

Beginning our work in Australia are the following collectors and explorers: Messrs. Crampton, Gregory, Hovey, Hurley, Raven.

From Australia the Museum has 38 *Invertebrate Fossils,* 272 *Rock* specimens and 36 *Aërolite* specimens. Australian *Minerals* constitute 1½ per cent. of our total.

Vertebrate Palæontology has little Australian representation in the collections. Its contributions constitute not more than one per cent. at the most. The chief element in this division of the collection is casts of *Diprotodon* and other Pleistocene vertebrates, with a small amount of original material.

Invertebrate Zoology has slightly more than 2,000 specimens, from localities on the west and north coasts. The *Insects* are likewise all from coastal stations, including (as in the case of other invertebrates) Tasmania and New Zealand.

The Australian *Fishes* are mostly new to the Museum, but they make up 2 per cent. of our total collection and cover 60 per cent. of the known genera. The First Australian Expedition brought home 150 fresh-water fishes, including both lung fishes and *Periopthalmus.*

We owe the greater number of our specimens of *Amphibians* and *Reptiles* to the same expedition. These now number more than 500, which come mostly from southeastern Australia and Tasmania.

Our principal representation of Australian-New Zealand *Birds* has been obtained by exchange, although the recent work of Mr. Raven in eastern Australia and Tasmania has added materially to our series. We still lack a considerable number of Australian genera and have, in fact, practically nothing from the western half of the continent. Doctor Sanford has recently given special attention to the New Zealand avifauna, and through both exchange and purchase we have filled gaps among the water birds and have acquired many of the rarer terrestrial forms, including several now on the verge of extinction. Mr. J. Sanford Barnes has made an important addition to the Neozelanic collection by recently presenting a specimen of the extremely rare extinct ground parrot of Chatham Island.

The Australian *Mammals* number 1,337 specimens, of which more than 200 are skeletons. Eighty-five per cent. of all the gen-

era of Australian marsupials and monotremes are now in the Museum's collections, but it should be noted that we have no mammalian collections from the western eight-tenths of the Island Continent.

In *Anthropology,* a few general *Archæological* collections come from extreme southeastern Australia. Comprehensive *Anatomical* material, including a skeleton and 30 skulls of Australian aborigines, represents the central part of the continent, while New Zealand has supplied us far more adequately. Our only *Ethnographic* specimens come likewise from Central Australia and New Zealand.

OCEANIC ISLANDS

Our surveys and collections in Oceanic Islands include the names of Messrs. Andrews, Beck, Beebe, Bennett, Bickmore, Brown, Chapman, Comer, Correia, Crampton, Lucas, Lumholtz, Murphy, Townsend.

Oceanic Islands, as here used, include not only Polynesia but all the island areas excepting such large continental islands as those of the West and East Indies, New Zealand, and the small bodies of land lying close in shore on the continental shelves.

The Department of *Geology and Invertebrate Palæontology* has not only certain specimens dredged from various parts of the oceans but also a creditable series from many Atlantic islands, including the Azores, Bermuda and South Georgia. The Pacific islands and those of the Indian Ocean have yielded much less, although we have 7 invertebrate fossils, 55 rock specimens, and one meteorite from Hawaii, as well as a single meteorite from Mauritius.

All the oceans and nearly all the seas, with their subdivisions, have contributed to the collections of *Invertebrate Zoology.* The insular collections come from many areas between the Arctic lands and the South Shetland group on the threshold of the Antarctic. In Polynesia, practically every important insular group is represented, and many of the small isolated islands as well. The Whitney South Sea Expedition has done considerable to swell the recent growth of material from this part of the world. The Mascarene and other islands of the Indian Ocean have likewise yielded specimens, while the Atlantic representation includes material from Bermuda, the Azores, Madeira, the Canaries, the Cape Verdes, Ascencion, St. Helena, the Falklands, and South Georgia, besides

the South Shetland Islands already mentioned. Nine thousand eight hundred specimens bear Hawaiian labels, 1,500 Society Islands labels, and several thousand more are still to come to us from Professor Crampton's last expedition. Among other interesting Pacific localities to be noted are Juan Fernandez, Easter Island, and the Galapagos, the greater part of the material from the last group bearing the labels of Mr. Beebe's recent expedition.

Insular *Insects* are less well covered by the Museum's collections. We have, however, a scattering of specimens from many Polynesian localities and from the Falkland Islands, together with more representative series from Bermuda, the Galapagos and Hawaii.

Fishes are treated fully under the continental headings. It may be well to note here, however, that not less than one-half of the known genera are represented in our collection from any oceanic area. This is true even of the Antarctic region.

Island *Herpetology,* which includes only reptilian and chiefly lizard fauna, is poorly represented from the greater part of Oceanica, although the Harrison Williams Galapagos Expedition of the New York Zoological Society has given us a good representation from the Galapagos, and the Whitney South Sea Expedition particularly fine series from southern Polynesia and the Marquesas Islands. Our Hawaiian collection is also fairly adequate, although it includes rather less than 75 per cent. of the known fauna.

Island *Birds* are in general among the rarest in museum collections, but through the field work of the Whitney South Sea Expedition, the American Museum of Natural History has acquired the best representation of the little-known Polynesian avifauna which has ever been brought together. The expedition has been at work since September, 1920, and has thus far made collections at about ninety different islands. Through the coöperation of the Bishop Museum of Honolulu, the value of our Pacific insular material has been greatly increased by the acquisition of an almost complete representation of Hawaiian birds, including all but two or three forms of the curious and rare Drepanids.

Through earlier work, the Museum had already come into possession of splendid collections of birds from most of the maritime regions except the Indian Ocean area. Thus the work of Comer, Murphy and Correia had covered many of the north and south

Atlantic islands. Beck, Chapman and Murphy had obtained collections of birds along the greater part of the South American coast line, including Juan Fernandez, the Falkland Islands and South Georgia. More recently, Bennett has sent material from the South Shetland Islands. The Galapagos, the Aleutians, and other Pacific groups have been well covered by Beck, Beebe and other naturalists.

In *Marine Mammals* all the large species of whalebone whales —with the exception of the humpback and bowhead—are represented in the collections. There is no example of the latter species in any museum in the United States. The small *Neobalæna* of the Antarctic is still a desideratum.

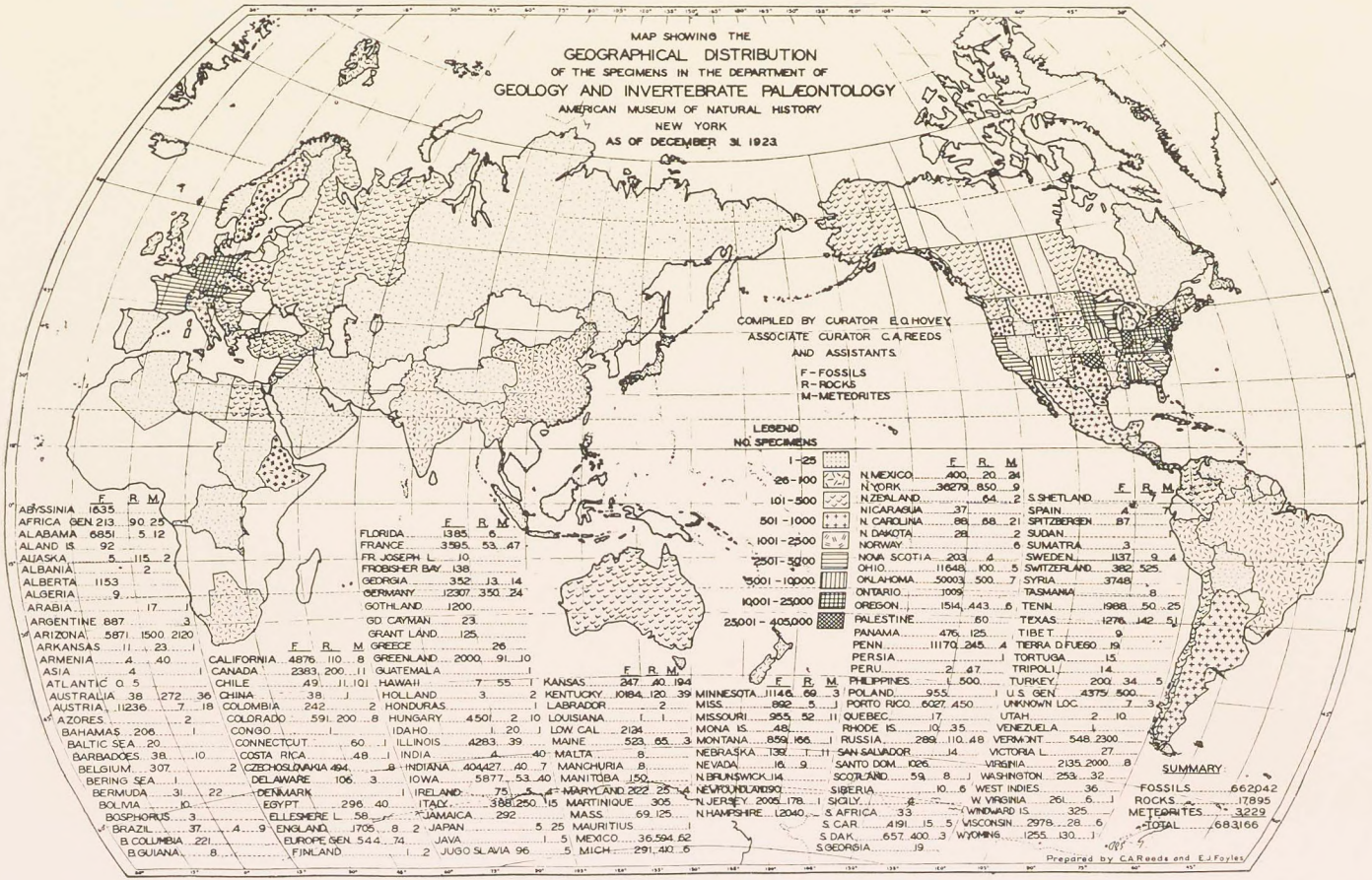
The Museum also has examples of the sperm whale and *Kogia,* the last from several localities. Examples of the larger *Ziphiidæ,* such as *Ziphius* and *Berardius,* are desiderata, but *Mesoplodon* is represented by species including the type *bowdoini.* About one-third of the recognized species of smaller toothed whales, from the killer down, are represented, the Museum being particularly rich in northern species, from both the Atlantic and Pacific.* The Museum is poor in the southern species of dolphins and in the fresh-water forms, having specimens of only two of the latter.

All species of Pinnipeds found in the North Atlantic are represented, and also the tropical *Monachus;* from the North Pacific we lack only the walrus and the Laysan *Monachus.* The Mediterranean *Monachus* and the Caspian seal are also desiderata. The seals of the South Atlantic and South Pacific are almost entirely absent from the collections, which contain not a single eared seal, only skulls of *Mirounga,* and skeletons of Weddell's seal and the sea leopard.

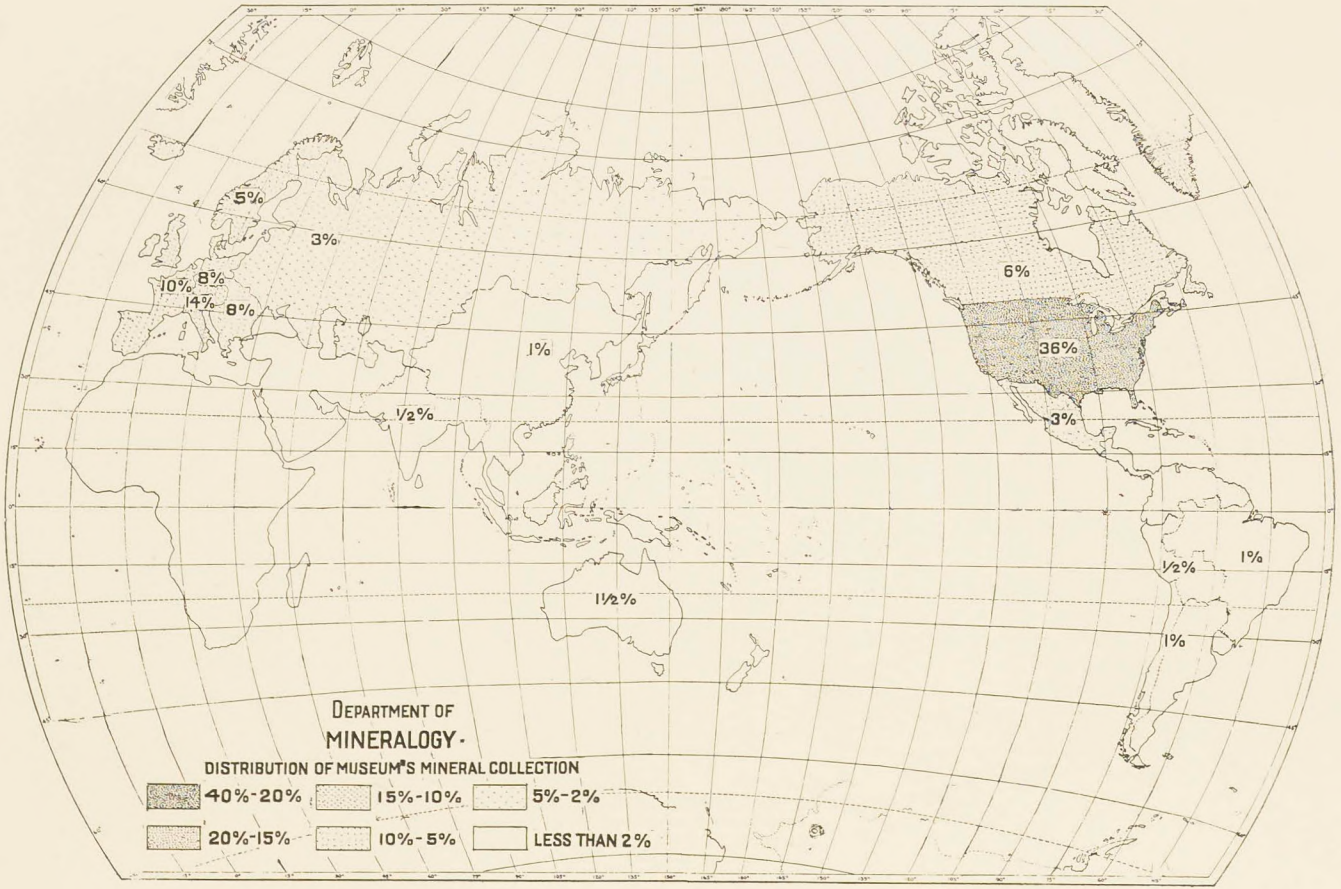
It should be added that more examples are needed of all the species noted, and this is particularly true of the Pinnipeds.

In *Anthropology,* our insular collections come almost exclusively from the Pacific archipelagoes. Polynesia, including Hawaii, and the Melanesian groups east of New Guinea, have supplied us with general *Anatomical* material, while the entire central Pacific region is reasonably well represented by *Ethnographic* specimens.

*Among them is the type of the singular True's dolphin.


MAP SHOWING THE
GEOGRAPHICAL DISTRIBUTION
OF THE SPECIMENS IN THE DEPARTMENT OF
GEOLOGY AND INVERTEBRATE PALÆONTOLOGY
AMERICAN MUSEUM OF NATURAL HISTORY
NEW YORK
AS OF DECEMBER 31. 1923.
COMPILED BY CURATOR E.O.HOVEY
ASSOCIATE CURATOR C.A.REEDS
AND ASSISTANTS.
F-FOSSILS
R-ROCKS
M-METEORITES
LEGEND
NO. SPECIMENS
1-25
26-100
101-500
501-1000
1001-2500
2501-5000
5001-10000
10001-25000
25001-405,000
Prepared by C.A.Reeds and E.J.Foyles
SUMMARY
FOSSILS 662042
ROCKS 17895
METEORITES 3229
TOTAL 683166

MAP I


5%
3%
10%
8%
14%
8%
1%
1/2%
6%
36%
3%
1%
1/2%
1%
1 1/2%
DEPARTMENT OF
MINERALOGY.
DISTRIBUTION OF MUSEUM'S MINERAL COLLECTION
40%-20%
15%-10%
5%-2%
20%-15%
10%-5%
LESS THAN 2%

MAP II

GEOGRAPHIC DISTRIBUTION OF COLLECTIONS

Rocks, Fossils and Meteorites

The collections of the Department of Geology and Invertebrate Palæontology comprise not fewer than 17,895 rocks, 662,042 fossils and 3,229 meteorites. The geographical distribution of these specimens, according to the major political divisions, is shown on the world chart, Map I. On this chart two methods of presentation have been employed: one, a graphic generalized series of line symbols for the larger land areas; the other, an alphabetical list of the names of the countries with their numerical representation entered opposite, arranged across the lower portion of the map.

The rocks include, among others, the James Hall collection from New York State; the New Hampshire and Vermont series assembled by Charles H. Hitchcock; the building stone collection of the Tenth Census, which is important for its representation of American localities; the Rosenbusch series of typical rocks; the Simplon Tunnel series; volcanic series from Martinique, St. Vincent, Hawaii and Vesuvius; cave material from Weyer's Cave, Virginia, Mammoth Cave, Kentucky, and Copper Queen Cave, Arizona; copper ores from Bisbee, Arizona; lead ores from Oklahoma, and zinc ores from Broken Hill, Australia. The Department's series, however, large though they are, form but a small proportion of the rocks and ores that should be represented in the Museum—important areas and subjects being here represented sparsely or not at all.

The invertebrate fossils in the Department of Geology and Invertebrate Palæontology, comprising 662,042 specimens, were assembled by various collectors in many parts of the world. The largest collections come from New York, Indiana and Oklahoma, while Pennsylvania, Ohio, Kentucky, Minnesota, Germany and Austria appear in the second group. The third group embraces Alabama, Arizona, Iowa and Porto Rico. In the fourth group may be noted South Carolina, Illinois, Wisconsin, California, Syria, France and Hungary. Five other groupings with fewer than 2,500 specimens are indicated on the map, while the portions of Canada, Greenland, Antarctica, South America, Africa, Europe and Asia which have no representation appear blank.

This large collection of invertebrate fossils is of value in that

it contains an unusually large representation of the diversified forms of marine life that have lived during the various periods in the geological history of the earth and which are genetically connected with the thousands of species living in the seas today. Many living forms may be seen in the collections of the Department of Lower Invertebrates of this Museum. This fossil assemblage is also noted for nearly ten thousand types, that is, the specimens which served as a basis for defining or illustrating the species known to science. The great James Hall collection of types and figured specimens forms the major portion of this part of the Department series. Although there are well over a half-million fossil specimens in this collection, there are large portions of the earth that are only sparsely represented and still others not represented at all.

The meteorite collection, containing representatives of 543 different "falls" and "finds," forms one of the half-dozen largest series of such objects in the world. The distribution of the geographical sources of the specimens is extremely irregular, because the distribution of the meteorites themselves is irregular. The chief portion of the collection in point of numbers, comprising about 400 "falls" and "finds," came to the Museum with the Bement Collection in 1902, presented by the late J. Pierpont Morgan, Esq. Besides this we have the Cape York (Greenland) meteorites, including the 36½-ton Ahnighito, presented by Mrs. Morris K. Jesup; Willamette (Oregon), weighing 15½ tons, the gift of Mrs. W. E. Dodge; some 2,000 bolides, which represent a considerable portion of the "stone shower" resulting from the explosion of a meteorite over Holbrook, Arizona; and several unique masses of meteoritic iron or stone. All but one of the forty States of the United States in which meteorites have been found are represented here by specimens. Although, or because, our meteorite collection is so large, we are always on the lookout for new specimens to add to it.

Minerals

As with all large mineral collections, that of The American Museum of Natural History includes mineral specimens gathered from all parts of the world. In order to arrive at an approximate estimate of the proportional distribution of the localities repre-

sented, two representative blocks of five cases each were selected and a detailed analysis of the geographical distribution of the 6,000 specimens contained in them was made, Map II. As a basis of this analysis, certain arbitrary groups of countries were assumed; for example, *Western Europe,* to include the British Isles, France and Belgium; *Central Europe,* to include Germany and Austria; *Southern Europe,* to include Italy, Switzerland and Tyrol; *Southeastern Europe,* to include Czechoslovakia, Hungary, Rumania and Greece; *Northern Europe,* to include Norway, Sweden and Iceland.

The estimated distribution of specimens is as follows:

Canada—Greenland	6%
United States	36%
Mexico	3%
Brazil—Uruguay	1%
Peru—Bolivia	½%
Chile	1%
Western Europe	10%
Central Europe	8%
Southern Europe	14%
Southeastern Europe	8%
Northern Europe	5%
Russia, including Siberia	3%
Japan—China	1%
India	½%
Australia	1½%
Scattering	1%

Fossil Vertebrates

On Map III are shown in solid circles the areas from which the more important collections of fossil mammals, birds, reptiles and batrachians have come. All continents and almost every important fossil field are represented in our collections. North America, the richest fossil field in the world, has yielded about 85 per cent. of our entire collection, and most of these specimens are from the Rocky Mountain region.

By far the greater part of our North American collection has been obtained by Department expeditions, which have been going to the West almost uninterruptedly since 1891, the year after the establishment of the Department. Our principal expeditions to foreign countries have been to Patagonia, Ecuador, Mexico, Porto Rico, Cuba and Jamaica in the western hemisphere, and India, Burma, China, Mongolia, Egypt and Greece in the Old World.

These expeditions, together with the purchase of some important collections, notably those of Cope, Warren, Sternberg and Broom, and a series of exchanges carried out with other museums, have resulted in the bringing together of a collection of fossil mammals and reptiles which is unexcelled.

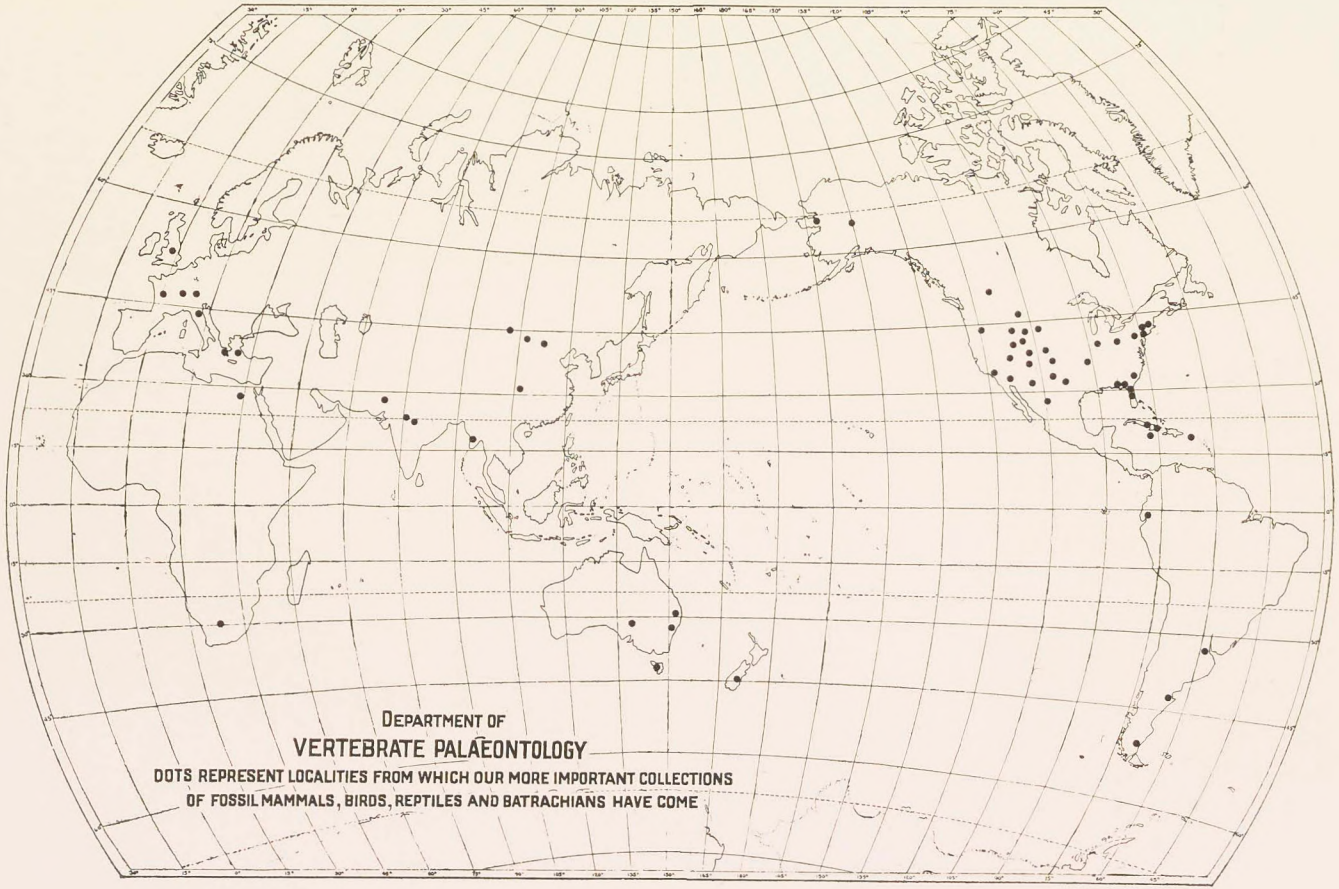
Estimated distribution of specimens:

North America	85%
South America (including West Indies)	4%
Eurasia	7%
Africa	3%
Australia	1%

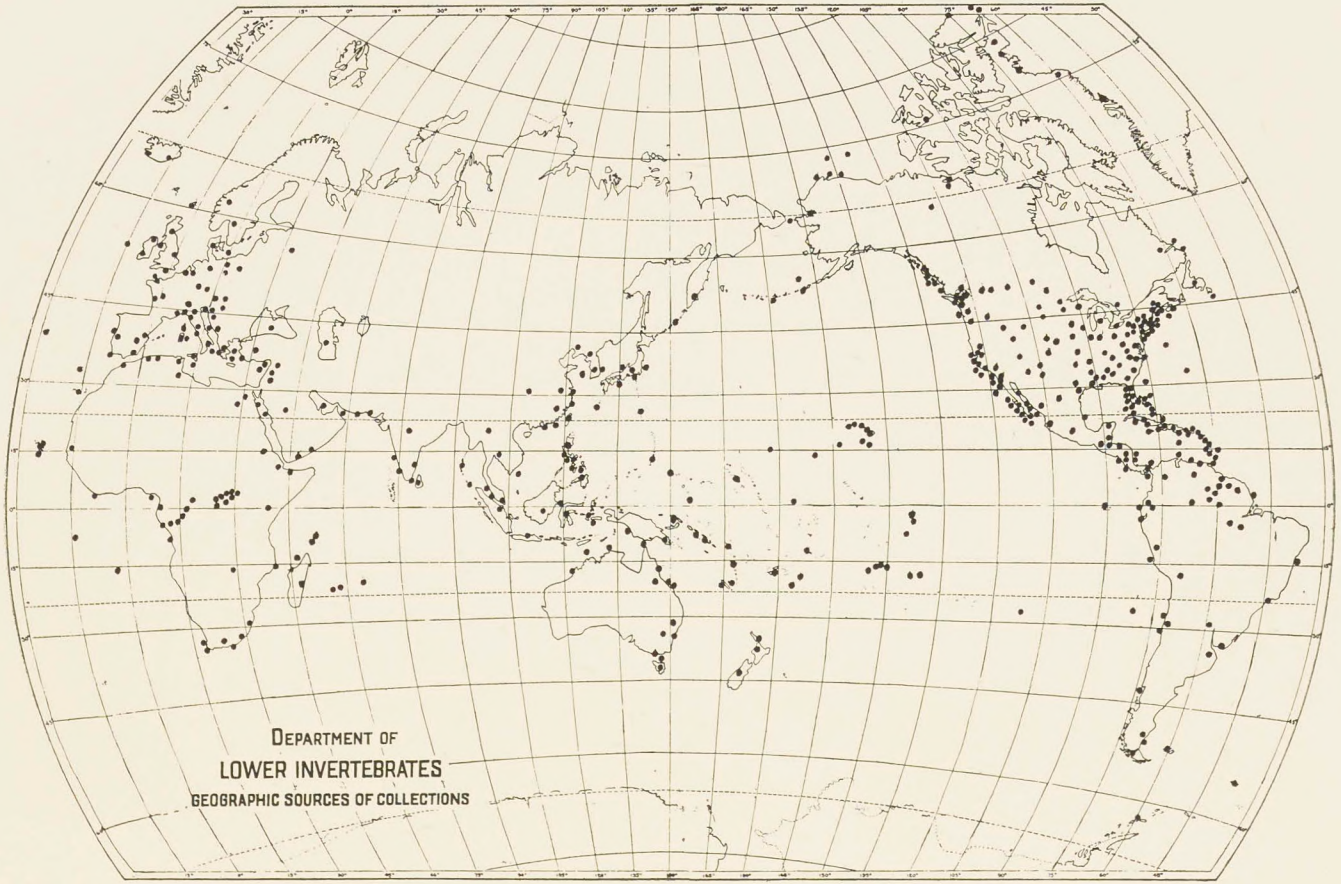
Lower Invertebrates

The chief areas not represented in the Lower Invertebrate collections are deserts and the great grassy plains, and certain regions as yet not sufficiently explored. This is apparent from Map IV.

All the Grand Divisions are well represented, including practically every country of the globe. All the oceans, and nearly all the seas, with their subdivisions, have contributed to the collections. As would be expected in the case of invertebrates, the greater number of localities are coastal or insular, though nearly every state in the United States has contributed its quota, and the inland countries of Europe are well represented. This latter fact is due to the fluviatile species in the collection, as well as to such land invertebrates as myriapods, land mollusks, isopods and worms. The heart of the Congo Region in Africa has contributed a very large series of such forms, and also the interior of northern South America. The temperate and tropical zones have naturally contributed the vast majority of specimens, though our records also include Arctic species from northern Alaska and Canada, Greenland, Iceland and Grant Land at 83° N., and southern forms from New Shetland at 62° S., nearly at the Antarctic Circle. In Oceanica, practically every important island group is represented and many of the small, isolated islands as well. Australia and New Zealand have contributed their quota, while the various islands of the Philippine Archipelago are very well emphasized, especially in the mollusk collections. The larger East Indian islands, the islands of the Indian Ocean, and all the small Atlantic


DEPARTMENT OF
VERTEBRATE PALÆONTOLOGY
DOTS REPRESENT LOCALITIES FROM WHICH OUR MORE IMPORTANT COLLECTIONS
OF FOSSIL MAMMALS, BIRDS, REPTILES AND BATRACHIANS HAVE COME

MAP III


DEPARTMENT OF
LOWER INVERTEBRATES
GEOGRAPHIC SOURCES OF COLLECTIONS

MAP IV

islands have given to our series, while practically every island of the West Indies, large and small, has received the concentrated attention of our expeditions.

Summarized in figures, the Lower Invertebrate collections comprise 233,034 identified and catalogued specimens, to which locality data can be assigned, besides several thousand without locality data, and many thousand in process of identification and therefore not yet catalogued. Of the above-mentioned number, 168,560 are mollusks, and 64,474 belong to other invertebrate phyla. This number is conservative, and a more exhaustive survey of the collections, which time does not permit, would add considerably to the number of species, specimens, and localities which can now be reported upon.

The following table summarizes the chief regions represented:

Geographic Region	*Number of Specimens*	
United States	46,784	
Canada	3,498	
Greenland	449	
Mexico	6,478	
Central America	1,176	
West Indies	49,170	
Total, North America	107,555	
South America	11,430	
Total, New World		118,985
Europe	14,235	
Asia	16,929	
Africa	41,267	
Oceanica, including Australia	41,618	
Total, Old World		114,049
Total in Collections		233,034

The largest series thus come from the West Indies, the United States, Africa and Oceanica. In the United States, California has contributed over 11,000 specimens, Florida 7,000, New York 4,000, and Massachusetts 3,000. The only States not represented are Montana and Nevada. The majority of the Canadian collections were made in New Brunswick, though practically all parts of southern Canada are represented, as well as the extreme Arctic coast. The Hudson Bay region and the country immediately to the west are not shown in the collections.

The Peary, Stefansson, and Crocker Land expeditions have brought a limited number of invertebrates from the Arctic Region.

The most important Mexican source has been the coast of Lower California, through the Albatross Expedition. In the West Indies, though nearly all the islands are represented, the most important sources thus far are: Porto Rico with 13,000 specimens, Dominica with 6,000, the Bahamas with 5,400, and Cuba with 4,500. In South America, the chief collections are from British Guiana and Patagonia, though all countries except Paraguay show in our collections.

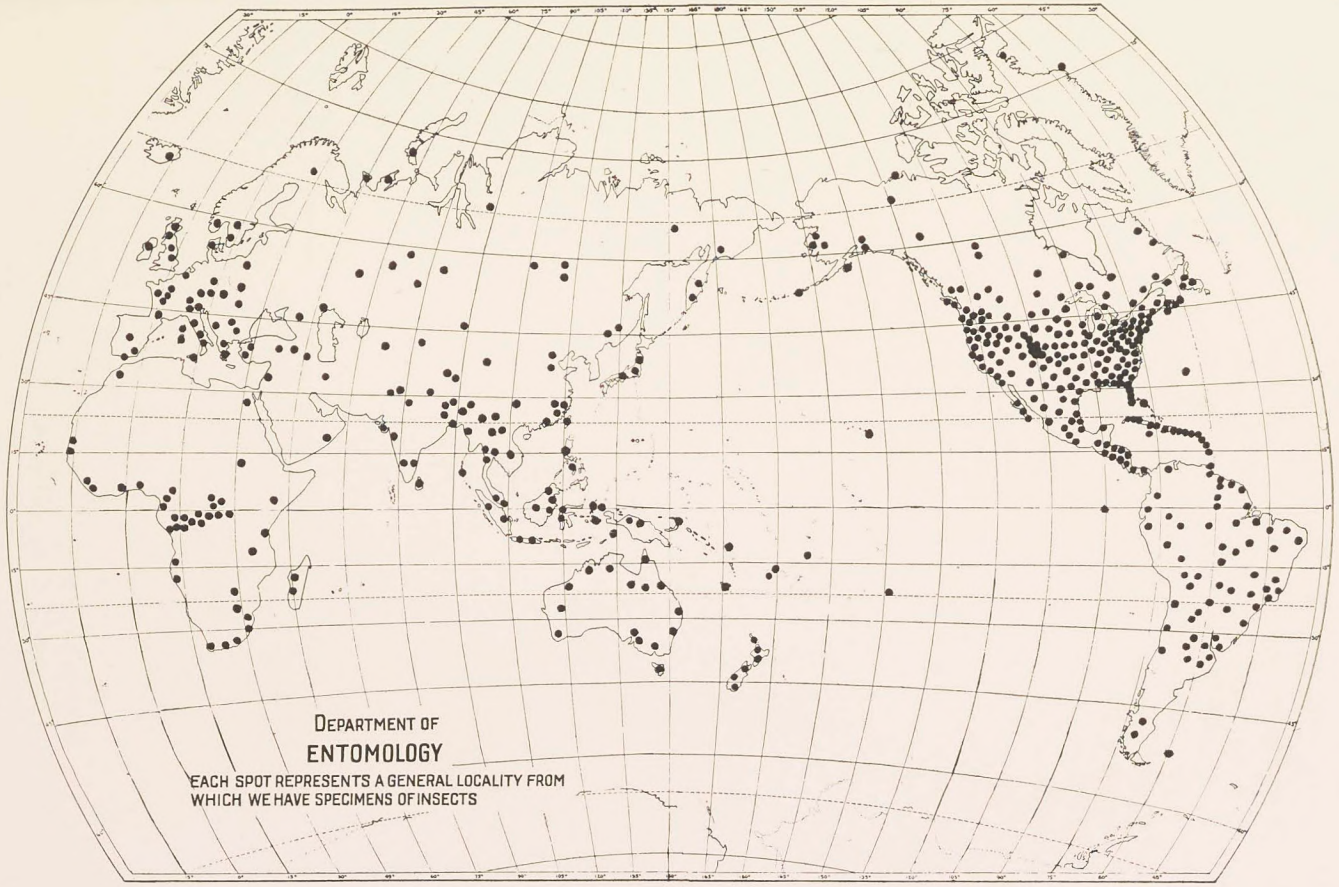
Our European series shows 5,000 specimens from the Mediterranean Sea, and 3,000 from England. Otherwise it is well distributed throughout the European countries with few exceptions. In Asia about 5,000 mollusks are from Ceylon, 4,000 from the Indian Ocean, 2,700 from China, and 2,000 from Turkey. The two latter items were largely contributed by the Third Asiatic Expedition and by Mr. Barnum Brown's collections. Over 1,000 specimens come from Japan. Practically all other Asiatic countries are represented, though the only Siberian locality as yet is Kamchatka, and no invertebrates have arrived from the Gobi region and other desert localities.

The largest African collection came from the Belgian Congo, as the result of the Lang-Chapin expedition, and comprised 28,700 specimens, the largest single collection that has been accessioned in the department. Other important sources have been British East Africa, Union of South Africa, French West Africa, and the Island of Mauritius. Other African countries and most of the islands off the coast of the continent are shown in the collections.

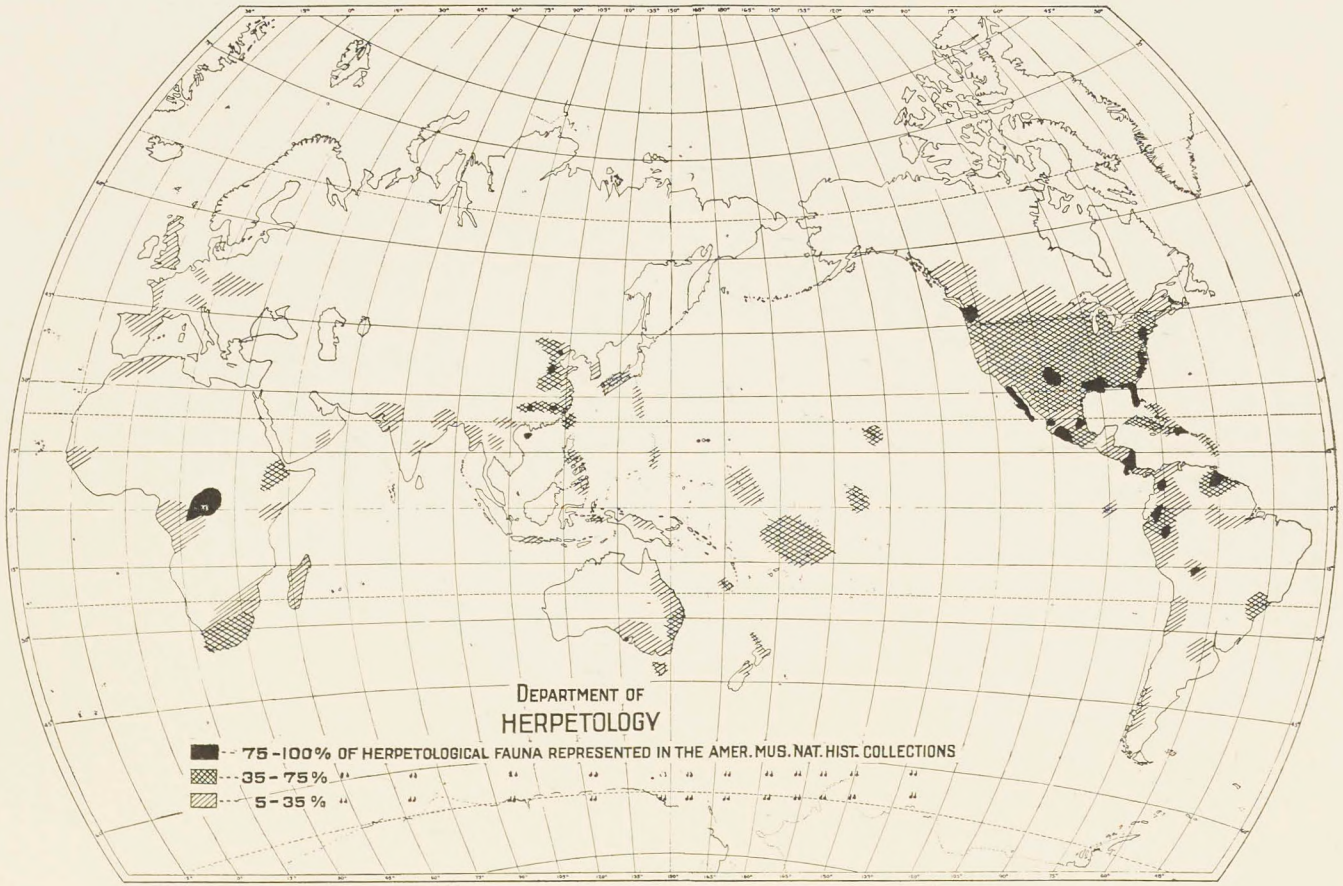
In Oceanica, the Philippines have furnished 12,700 specimens, Hawaii 9,800, New Zealand about 2,400, Australia 2,200, the Moluccas 2,000, the Society Islands about 1,500, though a large series is yet to come from Professor Crampton's trips; and the Loyalty Archipelago about 1,000. Most of the other island groups are represented by series ranging from a few specimens to collections of about 800.

Insects

The geographic distribution of our insect collections is shown in Map V, in which it is attempted to place a dot on the approxi-


DEPARTMENT OF
ENTOMOLOGY
EACH SPOT REPRESENTS A GENERAL LOCALITY FROM
WHICH WE HAVE SPECIMENS OF INSECTS

MAP V


DEPARTMENT OF
HERPETOLOGY
75-100% OF HERPETOLOGICAL FAUNA REPRESENTED IN THE AMER. MUS. NAT. HIST. COLLECTIONS
35-75% " " " " " " " " " " " " "
5-35 % " " " " " " " " " " " " "

MAP VI

mate location from which the Museum has specimens. Sometimes one dot covers a number of such localities; more often it covers too much country. In general, Map V shows that our insect collections have been assembled not only by such collectors as Beutenmuller, Lutz, Watson, and Wheeler, but by a host of other collectors, each contributing to the grand total.

Fishes

Our Department of Ichthyology is comparatively young, since it was not until 1903 that Professor Bashford Dean, of Columbia University, was put in charge; consequently our summary of collections does not compare very favorably with collections that have been made in other institutions, such as the United States National Museum, and the Museum of Comparative Zoology at Harvard, which have enjoyed the support of the great ichthyologists of America for more than half a century. The approximate geographic distribution may be summarized in the following figures:

Marine Fishes

Percentage of Total Collection		*Percentage of Total Living Genera*
25 per cent	Atlantic	70 per cent
25 " "	Pacific	60 " "
4 " "	Indian Ocean	50 " "
4 " "	Mediterranean	50 " "
1 " "	Arctic	60 " "
1 " "	Southern Ocean	50 " "

Fresh-water Fishes

9 per cent	North America	80 per cent
9 " "	South America	60 " "
9 " "	Africa	60 " "
6 " "	Asia	50 " "
3 " "	Central America	70 " "
2 " "	Europe	70 " "
2 " "	Australia	60 " "
	World genera	60 " "
100 "		

In the summary of the collection as a whole, we find the following:

Total species represented in the collection	3,000
Total specimens represented in the collection	30,000

The construction of the Hall of Fishes, which will communicate with the gallery of the Hall of Ocean Life, will give a splendid opportunity for the display of our exhibition collection.

Reptiles and Amphibians

In fourteen years our collections have increased nearly 1,000 per cent. The collections now number more than 57,000 adult specimens, in addition to the several thousand eggs and larvæ which are catalogued by lots. In Map VI we show by stippling the distribution of these collections.

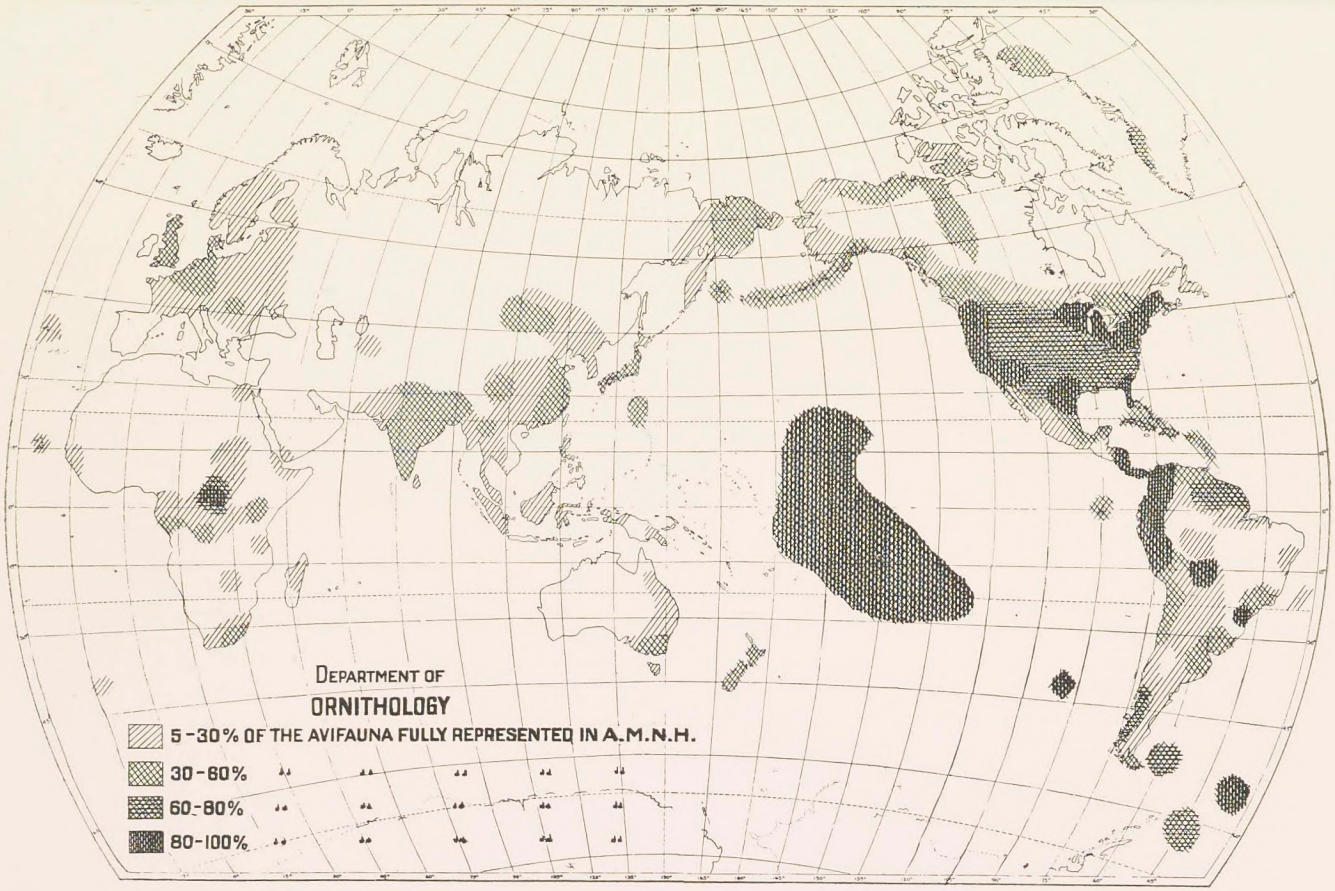
It will be observed that our greatest desiderata are to be found in the Oriental and East Indian region. Our study collection may be ranked among the five largest in the United States. It is a very representative collection, as the following table indicates:

	Number of Valid Genera in British Museum Catalogues	*Number of Genera in Collections of American Museum*
Cæcilians	11	11
Urodeles	26	22
Salientia	107	85
Rhynchocephalians and Chelonians	49	30
Crocodilians	6	5
Lizards	259	165
Snakes	296	167

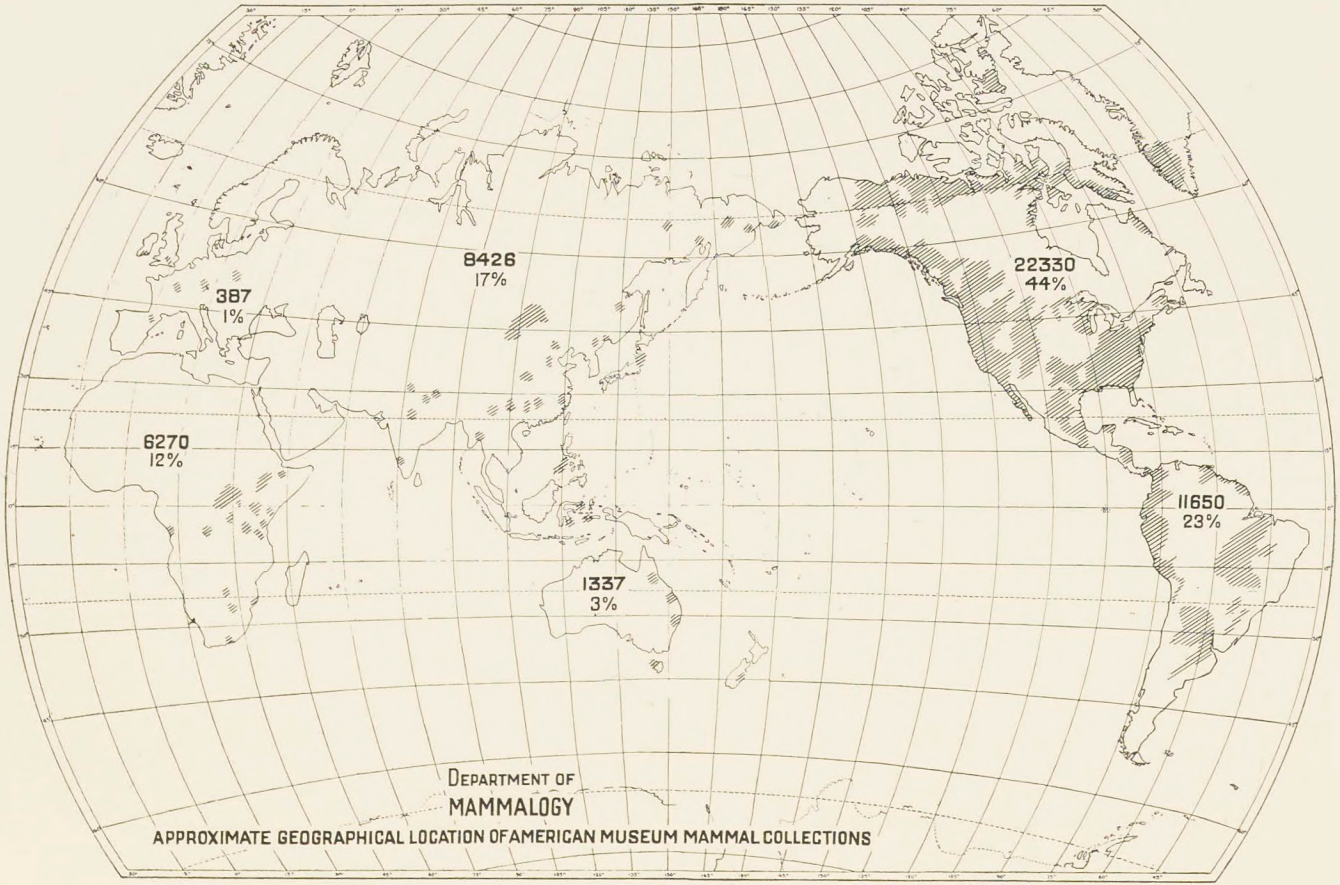
There are many more genera in the collections than are shown in the above table. These other genera have been described since the British Museum catalogues were issued. When one realizes that there were practically no study collections of reptiles and amphibians in the American Museum prior to 1900, and only 6,000 up to the year 1909, one begins to appreciate the great wealth of material which has recently outgrown our storerooms.

Birds

The distribution of the Museum's bird collections is illustrated on Map VII only in the broadest way. The object has been to show the territory rather than the species of birds covered by the collections. For example, we have practically all known North American species of birds, but instead of covering the continent in darkest shading, it has been found best to give an approximate idea of the source of the respective material. This not only shows


DEPARTMENT OF
ORNITHOLOGY
5-30% OF THE AVIFAUNA FULLY REPRESENTED IN A.M.N.H.
30-60%
60-80%
80-100%

MAP VII


8426
17%
22330
44%
387
1%
6270
12%
11650
23%
1337
3%
DEPARTMENT OF
MAMMALOGY
APPROXIMATE GEOGRAPHICAL LOCATION OF AMERICAN MUSEUM MAMMAL COLLECTIONS

MAP VIII

the parts of the continent which our collectors have most fully covered, but also the areas in which the least work has been done.

It will be observed that parts of the earth from which collections of birds are most urgently needed include the entire northern portion of Eurasia, together with Spain, the Mediterranean Basin, southwestern Asia, the Oriental region, western Australia, Africa outside the Forest Belt, Brazil, the islands of the Indian Ocean and a few of those in the South Atlantic. The ocean areas have not been cross-hatched, but mention should be made of the fact that the Museum now possesses a collection of marine birds which is probably the finest in existence.

Mammals

The collections in the Department of Mammals are summarized on Map VIII, with the data presented to show the regions whence the specimens have come. The percentages which appear on the map are intended to express the percentage of the total mammal collection which is found in the particular geographical area under consideration. Because there are many large areas of the earth's surface where the mammal life is not sufficiently well known to be set forth in an accurate list of species, it is practically impossible to give the percentage of known forms which are in the Museum collections. For example, the department collections comprise a very high percentage of all of the known North American species; on the other hand, in less well-worked areas, such as Asia and South America, the Museum possesses only a small proportion of the species which should occur on these continents, but until the regions are fully worked no one can say what part of the fauna is represented by existing collections.

Nearly half of the department collection comes from North America, with the sources covering the United States in the manner set forth and with a very strong representation from the Arctic regions due to the expeditions of Peary, Stefansson, Anderson, Comer, and the Crocker Land Expedition. The principal sources of the North American collection, exclusive of the Arctic regions, are: Prince Maximilian of Wied collection, and specimens collected by Anderson, Anthony, Batty, Chapman, Granger, Mearns, Richardson and Stone.

In South America the collections represent 23 per cent. of the

department total and come principally from Colombia, Ecuador, Peru, British Guiana, Brazil, Venezuela, and the Argentine. Most of the mammals were collected by Anthony, Batty, Beebe, Carriker, Keays, Klages, Miller, Richardson, Smith, and Tate. The mammals taken on Colonel Roosevelt's South American Expedition are included in this figure.

Europe is represented by comparatively few specimens—only one per cent. of the total collection in the department.

Asia is represented by 17 per cent. of the total collection, and a large part of this material has been brought in by the series of Asiatic expeditions under Andrews and by the Faunthorpe-Vernay Indian Expedition.

Africa claims 12 per cent. of the total, with the greater part of this percentage made up from the mammals taken on the Lang-Chapin Congo Expedition, the Akeley expeditions and a number of important sportsmen's expeditions made by Rainey, Rainsford, and Tjäder.

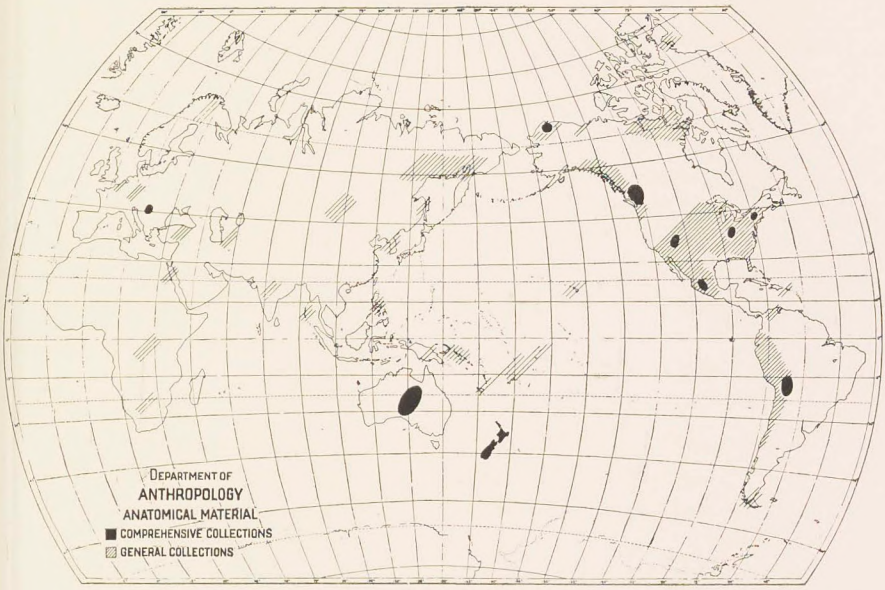
The mammals from Australia represent 3 per cent. of the total collection and were practically all secured on the expedition conducted by Gregory and Raven.

It will be seen that the collections from the Western Hemisphere are twice as large as those from the Eastern Hemisphere; that is to say, 67 per cent. (33,980) of the Museum mammal collection is New World in origin; 33 per cent. (16,420) is from the Old World.

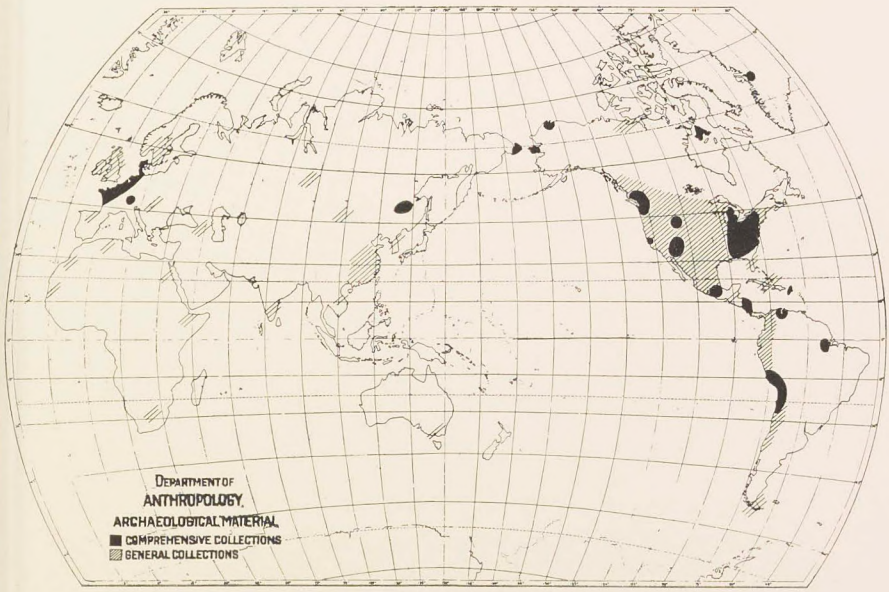
The map will illustrate two facts: first, that the expeditions sent out by the Museum have been world-wide in their scope; and, second, that there are still great areas unrepresented in the collection of mammals. Owing to the difficulties encountered in making complete and representative collections of mammals, many of these areas will be vacant on the department map for a long time to come, but there are many areas now white which in a short space of time can be marked in as the progress of Museum expeditions fills in the gaps.

Anthropological Collections

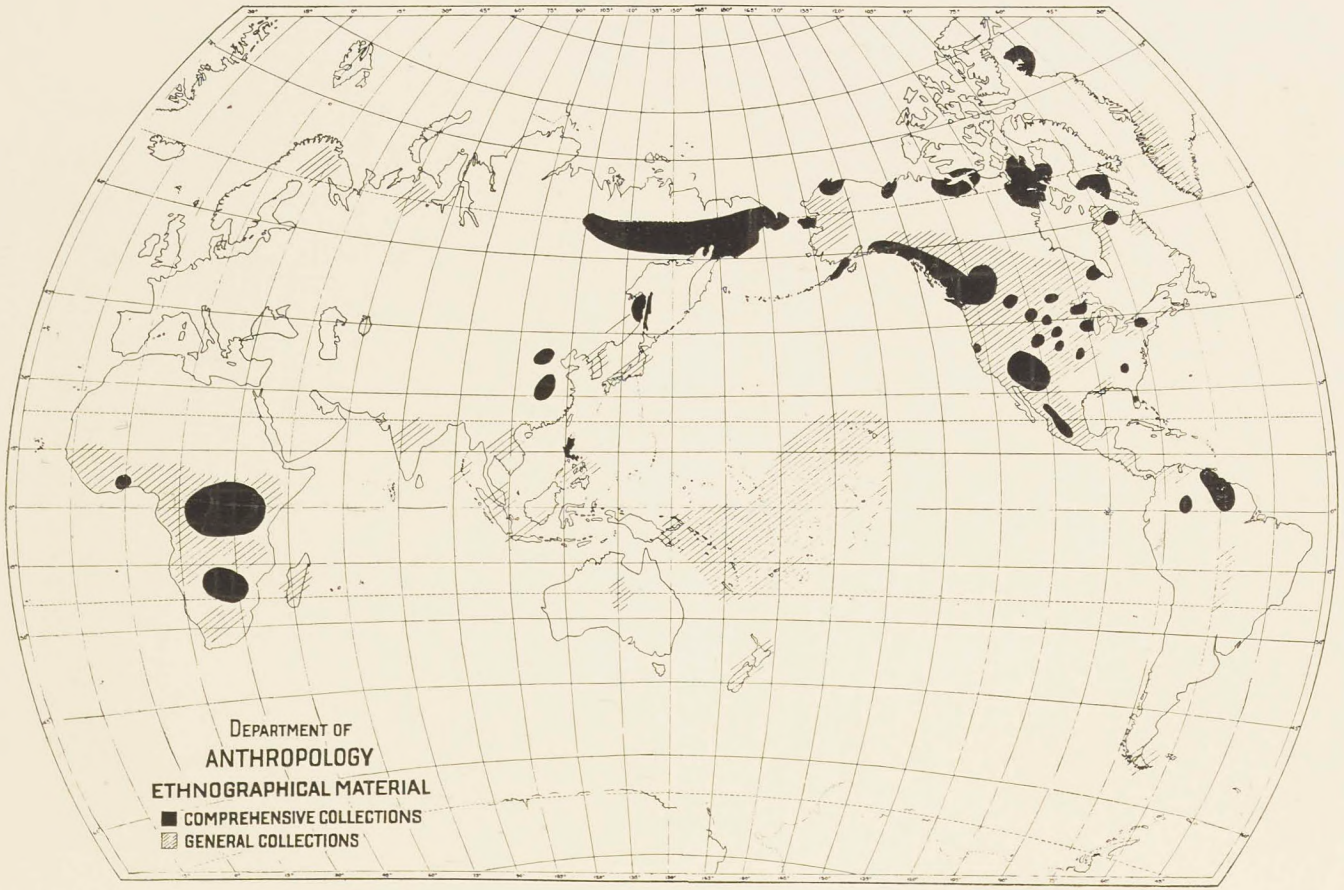
The collections as a whole fall naturally under the three traditional divisions of the science of man: anatomy, archæology, and ethnography. See Maps IX, X and XI. In the main, the ethno-


DEPARTMENT OF
ANTHROPOLOGY
ANATOMICAL MATERIAL
COMPREHENSIVE COLLECTIONS
GENERAL COLLECTIONS

MAP IX


DEPARTMENT OF
ANTHROPOLOGY
ARCHAEOLOGICAL MATERIAL
COMPREHENSIVE COLLECTIONS
GENERAL COLLECTIONS

MAP X


DEPARTMENT OF
ANTHROPOLOGY
ETHNOGRAPHICAL MATERIAL
COMPREHENSIVE COLLECTIONS
GENERAL COLLECTIONS

MAP XI

graphic and archæological collections were gathered by museum field parties, and to a large extent this is true of the materials for racial anatomy. Further, all the collections of the Division are handled in two rather distinct series, one for exhibition and one for reference or study. The latter is not mere dead storage material but is so arranged in classified assemblage as to be readily accessible at all times. Yet, at the same time it is well protected from insects, dust, and other destructive agents. For obvious reasons, the exhibition space is in the main given to ethnographical and archæological collections, which are installed in geographical units. The approximate number of specimens on exhibition and their geographical segregation are as follows:

North America:	
Ethnography of the North Pacific Coast	1,900
Of the Eastern Woodlands	8,477
Of the Western Plains	2,347
Of California and the Southwest	3,687
Of the Eskimo	3,000
Archæology of Mexico and Central America	8,411
Of the United States and Canada	25,000
South American Archæology and Ethnography	15,144
African Ethnography	4,658
Asiatic Ethnography	7,948
Malay and Philippine Ethnography	2,513
Islands of the Pacific Ocean	3,270
European Archæology	4,000
Racial Anatomy	300

This tabulation shows a fair balance between archæological and ethnographical material, but it is also true that the amount of material in storage far exceeds that on exhibition. It is also noticeable that relatively little exhibition space is given to anatomical materials, but in the ethnographic halls are to be found habitat groups in which there are life-sized figures of the several racial types. Finally, the following general summary gives a perspective of our total collections:

	Exhibition	*Study Series*
Ethnography	37,800	284,658
Archæology	52,555	875,063
Anatomy	300	27,000

SUMMARY OF THE MUSEUM COLLECTIONS TO THE END OF 1923

The summary of our collections from various parts of the world at the present time is approximately as follows:

Meteorites		3,229
Minerals and Gems		18,000
Geologic Specimens		17,895
Invertebrate Fossils, Palaeontology		662,042
Vertebrate Fossils, Palaeontology		30,000
Invertebrates		233,034
Insects	(about)	1,000,000
Fishes		30,000
Amphibians and Reptiles		57,500
Birds of the World		250,000
Mammals of the World		50,400
Anthropological Collections		1,250,000

NEARLY EIGHTEEN MILLION DOLLARS ADDED TO THE MUSEUM DURING THE PAST SIXTEEN YEARS

The gifts and appropriations to the Museum during the past sixteen years total nearly $18,000,000. In order to show how expenditures have kept pace with the increasing public service by the Museum and with the increasing cost of operation, attention is called to the following figures:

From the City of New York in Building and Equipment (including the School Service Building to be erected at a cost of $733,800), $3,045,725.54.

Contributions of members of the Board of Trustees, under Special Funds and Gifts, $2,895,241.82.

Gifts of Members and friends other than Trustees, $8,260,476.23.

Appropriations by the City for Maintenance and Operation of the Building and for Educational Work, $3,710,485.94.

Thus, during the past sixteen years, the grand total of additions to Permanent Equipment, to Building, to Exhibition, to Science and Education, Maintenance and to the Endowment of the Museum is $17,911,929.53, an average of more than $1,000,000 a year.

GENERAL ENDOWMENT FUND

The Present Total Endowment of $11,591,617.22 includes a number of generous recent contributions, as follows: Mr. George F. Baker, $250,000; Mr. Edward S. Harkness, $100,000; Mr. John D. Rockefeller, Jr., $1,025,000; Mr. J. P. Morgan, $127,187.50; Mr. George D. Pratt, $50,000; Mr. Arthur Curtiss James, $26,750; Mr. Felix M. Warburg, $19,000. This Endowment is still inadequate to the amount of $3,000,000 to meet the regular educational, exhibitional and operating expenses of the Museum, which have increased 250 per cent. during the sixteen-year period, chiefly owing to doubling and trebling of living costs, wages and salaries in the City of New York, which is now probably the most expensive city in the world.

It is estimated that an endowment of $15,000,000 or an addition of $3,408,382.78 will be needed to operate the Museum and

complete its educational exhibition system when the three new buildings—the *Asiatic Hall,* the *Oceanic Hall,* and the *School Service Building,* now under construction by the City at a total cost of $2,233,800, are completed in 1925.

Highly as the President and Trustees value the popular and financial appreciation of the Museum, they realize that the Museum is very far from being completed at present; that very extensive rearrangement of the collections must be made to bring about an ideal educational arrangement; that we must look forward in 1930, when the main Natural History Museum buildings as at present planned are complete, to a Permanent Endowment Fund of not less than $20,000,000, and so equivalent to that of the present endowment of the New York Public Library, in order to care for future increases in public and popular attendance and in the serious educational and scientific work in the schools, colleges and universities of this country.

MAINTENANCE AND OPERATING EXPENSES OF 1923

For the year 1923, the City Administration, appreciating the service that the Museum is rendering to the public, and especially its relations to the public school system, provided an appropriation of $342,313.36, which has been applied to the care and up-keep of the building and the maintenance of its educational activities. In the same liberal spirit, the City also appropriated $184,950 for necessary repairs, construction and equipment in the existing building, as well as an additional appropriation of $163,800 for the erection of the *School Service Building* now ready for construction. The growth of the institution has been so rapid that, generous as is the appropriation from the City for maintenance, it has been inadequate to meet the increasing cost of operation and school work, and the Trustees have applied $218,303.41 of Trustee funds to these maintenance and education expenses. In order not to curtail important work, the Trustees, at the beginning of the year 1923, guaranteed to raise $40,000 by personal subscription and actually contributed $38,000 for maintenance and operation, which, with various economies effected during the year, enabled the Treasurer to close his books without a deficiency.

The cost of operating the Museum in all its activities, including maintenance, education, exploration, publication, preparation and other scientific work, amounted to $1,085,462.25, the funds for which were derived from the following sources:

GENERAL OPERATING EXPENSES

City Appropriation for Maintenance	$342,313.36
Trustees' General Funds: (Applied to Maintenance and to Scientific Work)	325,154.54
Morris K. Jesup Fund: (Restricted to Scientific Work)	288,906.93
Special Funds: (Contributions for Specific Purposes)	105,803.60
Trustees' Building Fund	1,335.82
Corporate Stock Fund: (Appropriated by the City for Equipment)	21,948.00
Total Expenditures of the Museum for 1923	$1,085,462.25

PROGRESS IN BUILDING AND EQUIPMENT OF SECTIONS 9, 10 AND 11

The most important feature in the building program has been the progress in the erection of the *Southeast Wing* and *Hall of Ocean Life*. It has been a source of keen satisfaction to watch these two halls take final form. These buildings were provided for by an appropriation of $1,500,000, unanimously voted by the Board of Estimate and Apportionment on December 28, 1921. The general contract for the construction was awarded to James Stewart and Company on September 8, 1922, and actual work began officially on October 4, 1922. The excavation, which involved some unexpected problems in establishing the foundations for the building, was completed in December of the same year. During the present year (1923), in spite of inclement weather, strikes and delays in the delivery of material, construction has progressed satisfactorily. In the early fall, both buildings were entirely enclosed and the interior finish well begun. It now seems probable that both buildings will be completed by the middle of 1924.

TABLE I. KEY TO ARRANGEMENT OF EXHIBITION HALLS BY BUILDING SECTIONS

Names of Building Sections	*First Floor*	*Second Floor*	*Third Floor*	*Fourth Floor*
1. MEMORIAL	Jesup Memorial	World Bird Groups	Primates	Age of Man (History of the Earth V)
2. SOUTH AMERICAN*	Indians of Eastern North America	African Life	Siberia	Minerals and Gems (Morgan Hall)
3. POLYNESIAN	Indians of the Plains	Prehistory of South America	China and Japan	Races of Man
4. EUROPEAN	Indians of the Southwest	Ancient Peru	Peoples of Malaysia	Evolution of Human Culture
5. CENTRAL AMERICAN*	Aztec and Maya	Central American Culture	Pacific Island Peoples	History of Inventions
6. AUSTRALIAN	California and Plateau Indians	South American Tribes	Life of Australia	Study Hall (Crafts and Textiles)
7. ASTRONOMIC*	Meteorite Hall	Cosmic Geography	Gallery	The Firmament
8. BICKMORE	Northwest Coast Indians	Birds of the World (Elliot Hall)	North American Bird Groups	History of the Earth I
9. EDUCATION	Nature and Man			
10. NORTH AMERICAN	Trees of North America	North American Mammals (Allen Hall)	Mammals of the World (Buffon Hall)	Age of Mammals (Osborn Hall)
11. ARCTIC AND ANTARCTIC	Darwin Hall of Evolution	Polar Life	Insect Life	Closing Age of Dinosaurs (History of the Earth IV)
12. ASIATIC	Fishes of the World	Mammals of Asia	Reptiles of the World	Early Age of Reptiles (History of the Earth III)
13. OCEANIC	Mollusks			
14. ROOSEVELT*	Association Headquarters	Roosevelt Memorial	Roosevelt Memorial	Gallery
15. AFRICAN	Geography of Africa	Mammals of Africa	African Natural History	History of the Earth II
16. NEW LECTURE AMPHITHEATER*				

* THE SIXTEEN BUILDING SECTIONS, as shown in the map entitled "General Building Plan of The American Museum of Natural History, 1923," printed in the Fifty-fourth Annual Report.

There will be sixteen building sections in The American Museum of Natural History, of which eleven have been completed or are under construction, and five are being planned for future construction. These five are indicated by asterisks in Table I.

TABLE II—EXHIBITION HALLS (*Continued*)

Names of Exhibition Halls	*Names of Building Sections*	*Floor*
JESUP MEMORIAL	Memorial	I
WEST ASSEMBLY	West Corridor	I
INDIANS OF EASTERN NORTH AMERICA	South American	I
INDIANS OF THE PLAINS	Polynesian	I
INDIANS OF THE SOUTHWEST	European	I
AZTEC AND MAYA	Central American	I
CALIFORNIA AND PLATEAU INDIANS	Australian	I
NORTHWEST COAST INDIANS	Bickmore	I
NATURE AND MAN	Education	I
METEORITES	Astronomic	I
EAST ASSEMBLY	East Corridor	I
TREES OF NORTH AMERICA	North American	I
DARWIN HALL OF EVOLUTION	Arctic and Antarctic	I
FISHES OF THE WORLD	Asiatic	I
MOLLUSKS	Oceanic	I
OCEAN LIFE	Oceanic (Ground floor)	
ROOSEVELT MEMORIAL OFFICES	Roosevelt	I
GEOGRAPHY OF AFRICA	African	I
WORLD BIRD GROUPS	Memorial	II
BIRDS OF NEW YORK	West Corridor	II
BIRDS OF THE WORLD (Elliot Hall)	Bickmore	II
COSMIC GEOGRAPHY	Astronomic	II
AFRICAN LIFE (Human)	South American	II
PREHISTORY OF SOUTH AMERICA	Polynesian	II
ANCIENT PERU	European	II
CENTRAL AMERICAN CULTURE	Central American	II
SOUTH AMERICAN TRIBES	Australian	II
TRUSTEES' ROOM	East Corridor	II
NORTH AMERICAN MAMMALS (Allen Hall)	North American	II
POLAR LIFE	Arctic and Antarctic	II
MAMMALS OF ASIA	Asiatic	II
ROOSEVELT MEMORIAL	Roosevelt	II
MAMMALS OF AFRICA	African	II
PRIMATES	Memorial	III
DOMESTIC ANIMALS	West Corridor	III
NORTH AMERICAN BIRD GROUPS	Bickmore	III
SIBERIA (Ethnographic)	South American	III
CHINA AND JAPAN	Polynesian	III
PEOPLES OF MALAYSIA	European	III
PACIFIC ISLAND PEOPLES	Central American	III
LIFE OF AUSTRALIA	Australian	III
COSMIC GEOGRAPHY (Gallery)	Astronomic	III
MEMBERS' ROOM	East Corridor	III
MAMMALS OF THE WORLD (Buffon Hall)	North American	III
INSECT LIFE	Arctic and Antarctic	III
REPTILES OF THE WORLD	Asiatic	III
ROOSEVELT MEMORIAL	Roosevelt	III
AFRICAN NATURAL HISTORY	African	III
AGE OF MAN (History of the Earth V)	Memorial	IV
THE HORSE	West Corridor	IV
MINERALS AND GEMS (Morgan Hall)	South American	IV
RACES OF MAN	Polynesian	IV
EVOLUTION OF HUMAN CULTURE	European	IV
HISTORY OF INVENTIONS	Central American	IV
STUDY HALL (Crafts and Textiles)	Australian	IV
THE FIRMAMENT	Astronomic	IV
HISTORY OF THE EARTH I	Bickmore	IV
AGE OF MAMMALS (Osborn Hall)	North American	IV
AGE OF DINOSAURS (History of the Earth IV)	Arctic and Antarctic	IV
EARLY AGE OF REPTILES (History of the Earth III)	Asiatic	IV
HISTORY OF THE EARTH II	African	IV
KEY TO PALÆONTOLOGY	East Corridor	IV

In each section, the exhibition floors are indicated by Roman numerals I-IV. The total number of exhibition, assembly and lecture halls is sixty-two, as shown in Table II.

The construction of these two sections will add six new exhibition halls to the Museum, which are being constructed after plans gradually maturing since the year 1911, when the present arrangement was decided upon, and which promise to be at once the most beautiful and the most impressive exhibition halls in the world. They embody the latest ideas and ideals of Museum construction and are receiving the scientific supervision of leading experts like Honorary Director Frederic A. Lucas; Assistant Director James L. Clark, in charge of Preparation; the noted animal sculptor, Carl E. Akeley; the ichthyologist, Bashford Dean (also on the Metropolitan Museum Staff); Roy C. Andrews, explorer and mammalogist; Roy W. Miner, specialist in invertebrate zoology; the herpetologist, G. Kingsley Noble; and the palæontologists, Henry Fairfield Osborn and William Diller Matthew.

In the *Hall of Ocean Life* will be displayed the whales, porpoises, seals, sea elephants, and other great sea animals, which, through the generous contributions of the late George S. Bowdoin and of Mr. Arthur Curtiss James, have been brought together by years of field work at the whaling stations in British Columbia, Alaska, Japan and Korea, and by expeditions to the Pacific Coast. In the center of the hall will be suspended a life-size model of the humpback whale in the act of diving. This animal is 50 ft. long and has a flipper spread of 40 ft. At the west end of the hall will be an accurate reproduction of a West Indian Coral Reef. This Habitat Group will be 30 ft wide, 12 ft. deep and 25 ft. high, and will be so arranged that the visitor descending from the gallery of the hall to its main floor will pass beneath the surface of the ocean and have an opportunity to view the corals and other marine life at close range.

The *Southeast Wing* will contain on the first floor our collection of fishes, which for several years has been incongruously housed amid our collection of birds of the world. The second floor will be the *Asiatic Hall,* which will be devoted to the splendid new Asiatic collections presented through Colonel J. C. Faunthorpe and Mr. Arthur S. Vernay, as well as the rich collections of the Third Asiatic Expedition, which will include the antelope, wild ass and other animals of the Mongolian Plains. The *Hall of Amphibians and Reptiles* will occupy the third floor, while in the

fourth floor hall will be installed the giant aquatic dinosaurs and other ancient fossil reptiles.

The next building project is the *School Service Building,* for which the Board of Estimate and Apportionment appropriated $570,000 on April 21, 1922. Since that time the plans for this building have received most careful study by the architects and staff members, until now we believe we have planned the best designed building possible for extending the usefulness of the Museum to the entire school system. The increasing cost of all building operations, due to labor conditions and higher prices for materials, combined with the somewhat specialized character of this building, made it necessary to apply to the Board of Estimate and Apportionment for an additional appropriation of $163,800 for the erection of this building. This supplementary appropriation was voted by the Board on June 29, 1923, thus making the total amount available for the *School Service Building* $733,800. In the meantime, the plans and specifications have been completed and have been forwarded to the Board of Estimate and Apportionment for final approval.

The *School Service Building* will occupy the southwest court and will be devoted to the relations of the Museum to the schools. It will be a five-story structure, 160 ft. long by 90 ft. wide on the ground floor, and 56 ft. wide on the upper floors. The first or main floor will be a huge exhibition hall, which is especially needed for the many temporary exhibitions held annually at the Museum, such as the flower shows of the New York Horticultural Society and various anniversary exhibitions. We also expect that from time to time displays of the handiwork of school children, especially in the art and design classes, will be shown in this hall. The principal function of the building, however, is to provide classrooms for visiting classes of children, laboratories and offices for the educational staff and proper facilities for the care and distribution of our Nature Study Collections and our large series of lantern slides, which are made available for the schools of the city. We regard the liberal action of the Board of Estimate and Apportionment, in providing for the erection of this building, as indicating its appreciation of the Museum's service to the schools, and we greatly appreciate this recognition of the Museum's contribution to education.

SCHOOL SERVICE AND ATTENDANCE DURING SIXTEEN YEARS

The corresponding growth of public interest in the Museum during the sixteen-year period is shown by the increase in attendance from 537,984 in 1907 to 1,431,722 in 1923, an increase of more than 166 per cent. The school service attendance in the Museum, included in the above figures, increased from 30,000 in 1907 to 134,669 in 1923, while the total number reached by the Museum's extension service to the schools has increased from 778,510 in 1907 to 5,630,811 in 1923, a gain of 623 per cent. The Annual Membership income has risen from $15,300 in 1907 to $38,395 in 1923.

INCREASE IN MUSEUM COLLECTIONS DURING 1923

The year 1923 has been exceptional in the rapid increase of collections from all parts of the world. Either an emergency gift of $300,000 for preparation and exhibition, or the annual interest on a new endowment fund of $3,000,000, is needed to keep up with this astonishing growth through the Museum's expeditions and through the liberality of the City in the erection of new buildings.

First in importance, during the year 1923, is the Faunthorpe-Vernay Collection from India, including gifts by the Viceroy of India and the Maharajas of Nepal and Mysore—a superb collection of mammals and birds valued at not less than $100,000. The Museum is also indebted to Mrs. Henry Clay Frick for the gift of a unique collection of fossils from the Siwalik Hills of India and from Burma, of a total value of $15,000. Mr. Childs Frick contributed during the year $14,800, making his total contribution $53,250 toward collections, chiefly of Pliocene age, from California and other Western States. Mr. Harry Payne Whitney has continued for the third year his annual gift of $20,000 to secure a representative collection of the birds of the Oceanic Islands of Polynesia. An indirect gift for the support of the Martin Johnson Second African Expedition by the Martin Johnson African Expedition Corporation, for five years, involves an annual expenditure of $20,000.

THIRD ASIATIC EXPEDITION

The Third Asiatic Expedition has been the most successful expedition in the whole history of the Museum. The collections and scientific results achieved during the first three years in China and Mongolia, under the direction of Roy Chapman Andrews, have far surpassed our fondest expectations. Our indebtedness to Messrs. Andrews, Granger, Berkey, Morris and Pope cannot be expressed. On invitation of Mr. Andrews, President Osborn traveled to China and Mongolia in the autumn of 1923 to inspect the personnel and management, and to visit some of the most important deposits in east-central Mongolia. On returning to the Museum headquarters in Peking, he agreed with the leader that the work in Mongolia was so profoundly important that it would require an additional five years and that the staff should be enlarged to include topography, palæo-botany, and archæology.

The expedition has aroused world-wide interest. In addition to the series of special articles in ASIA Magazine, which has strongly supported the expedition financially, a series of articles is appearing in *Natural History,* concluding with a report by the leader, entitled "The Coming Five Years, 1924-28, of the Third Asiatic Expedition." Nineteen preliminary scientific papers have appeared in Museum publications. A series of twelve volumes, to be entitled *Mongolia and China,* is projected and will include the complete scientific results of the expedition.

The great collections of fossils have been safely transported from central and western Mongolia and are now being given the place of honor in the center of the Hall of the Age of Mammals.

The President can hardly find language to express his appreciation to the scientific workers of this expedition and to the liberal contributors from twenty-five States of the Union, including the American Asiatic Association. During the three years the contributions toward the cost of the expedition have amounted to $360,000. A full list of contributors appears in the March-April, 1924, number of *Natural History,* at the close of Mr. Andrews's article, "The Coming Five Years."